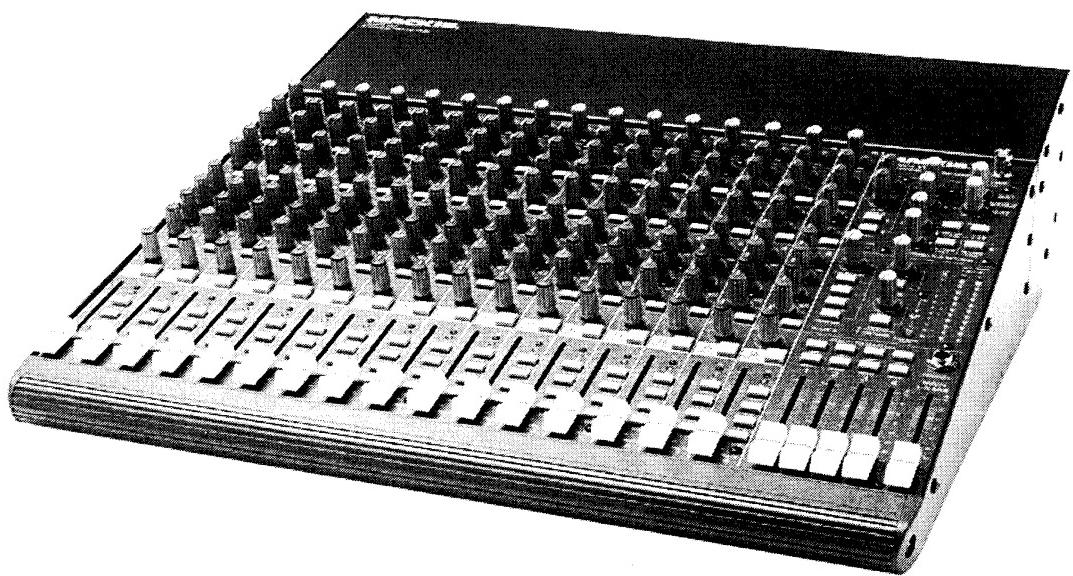


# **1604-VLZ™**

## **16 CHANNEL MIC/LINE MIXER**

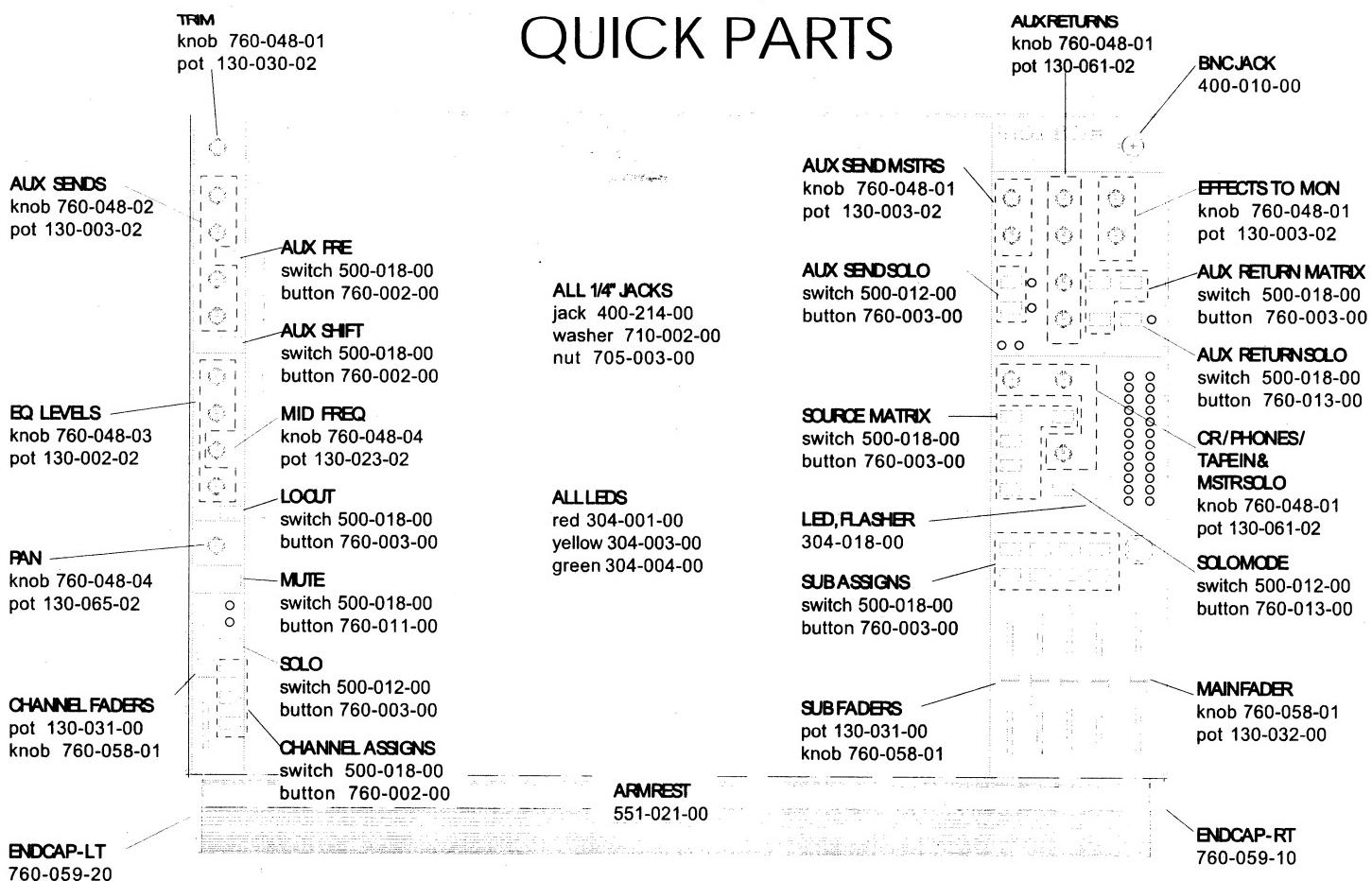


## **SERVICE MANUAL**

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Block Diagram	2
Channel Schematic	3
Pod Section Schematics	4-6
Pod Section PCB Layout	7-8
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Main Section PCB Layout	15
Jumper Location and Pinout	16
Power Supply	17

MACKIE DESIGNS INC., 16220 WOOD-RED ROAD, WOODINVILLE, WA 98072, USA  
820-172-00 05/99

# QUICK PARTS



## SCREW PLACEMENT...

TOP ALLEN SCREWS 700-011-00	SIDE SCREWS 700-006-00	XLR SCREWS 700-005-00	STARGROUND screw 700-031-01 nut 705-001-00
BOTTOM SCREWS 701-002-00	END CAP SCREWS 700-010-06		
SIDE POD SCREWS 700-004-00	FLATE SCREWS 700-010-00		

## METAL...

CHASSIS BOTTOM 550-173-00	POD BOTTOM 550-175-00
CHASSIS TOP 550-172-10	POD TOP 550-174-00
CABLE PLATE 550-176-00	BUFRON 750-001-00

## POD COMPONENTS...

**ALL 1/4" JACKS**  
jack 400-214-00  
washer 710-002-00  
nut 705-003-00

**FEMALE XLR INPUT**  
400-223-00

**RCA IN/OUT**  
400-022-00

**IEC RECEPTACLE**  
400-009-00

**PWR SWITCH**  
500-013-00

**PHANTOM SW**  
500-016-00

**MONO OUTPUT**  
knob 760-007-00  
pot 130-062-02

## INTERNAL PARTS...

**TRANSFORMER**  
100V 080-008-02  
120V 080-008-00  
230V 080-008-01

**PCB-POD**  
055-219-00-01

**PCB-MAIN**  
055-220-00-01

**PCB-PWR**  
055-066-00

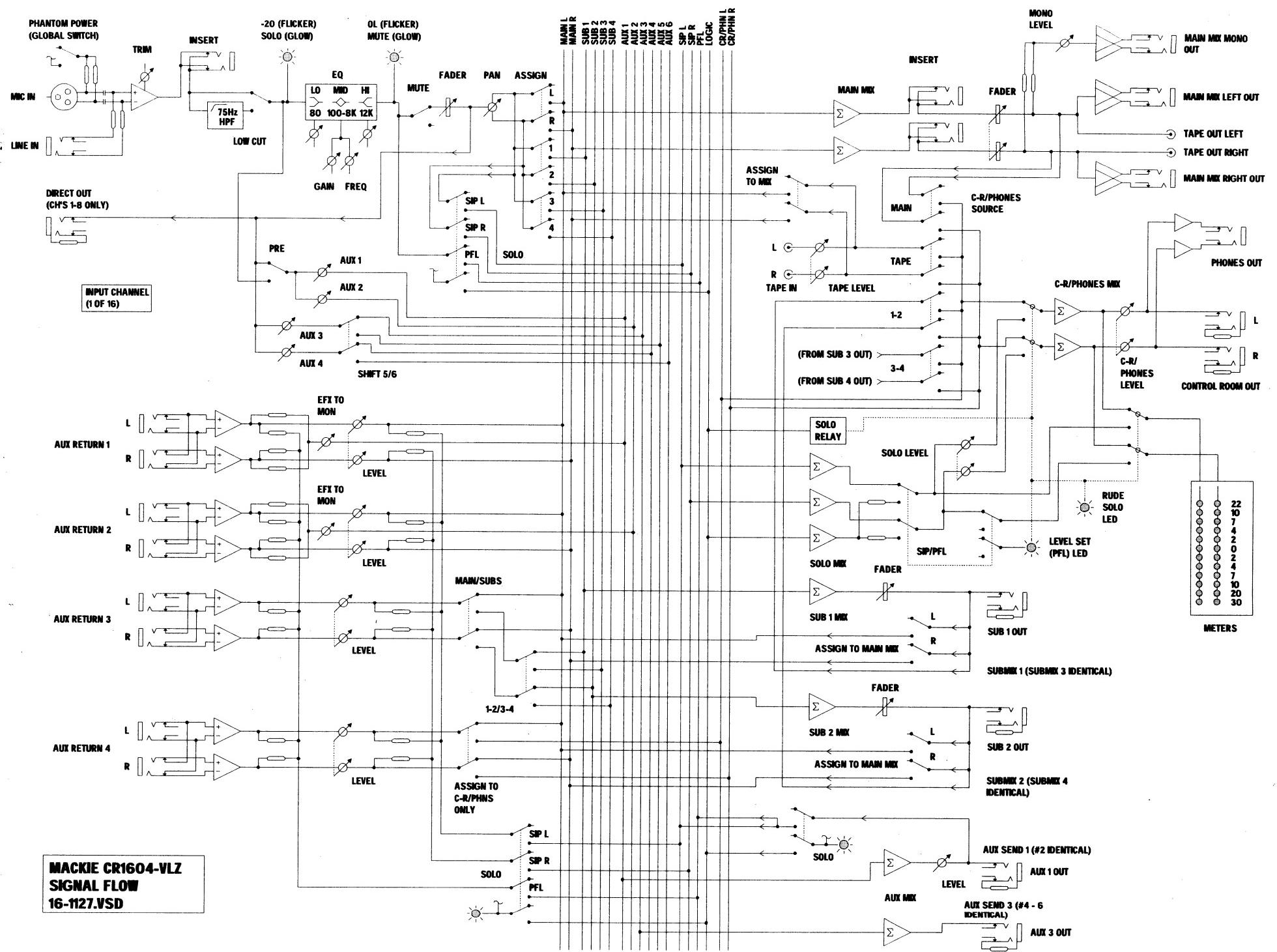
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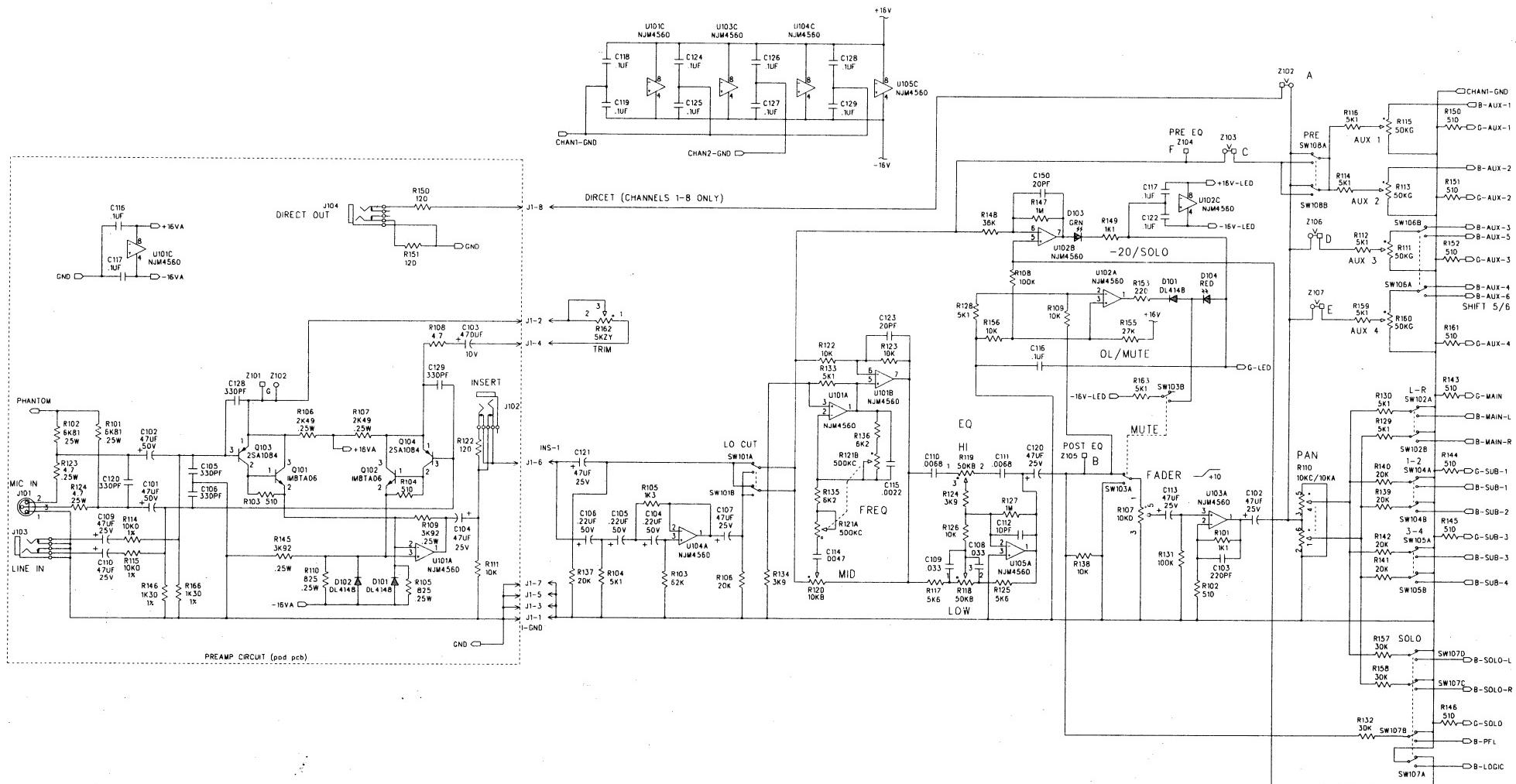
**ROTO RACK EARS**  
L - 550-179-00  
R - 550-180-00

**RACK EARS**  
550-177-00 (X2)

**ACLINECORD**  
(120V) 640-001-00

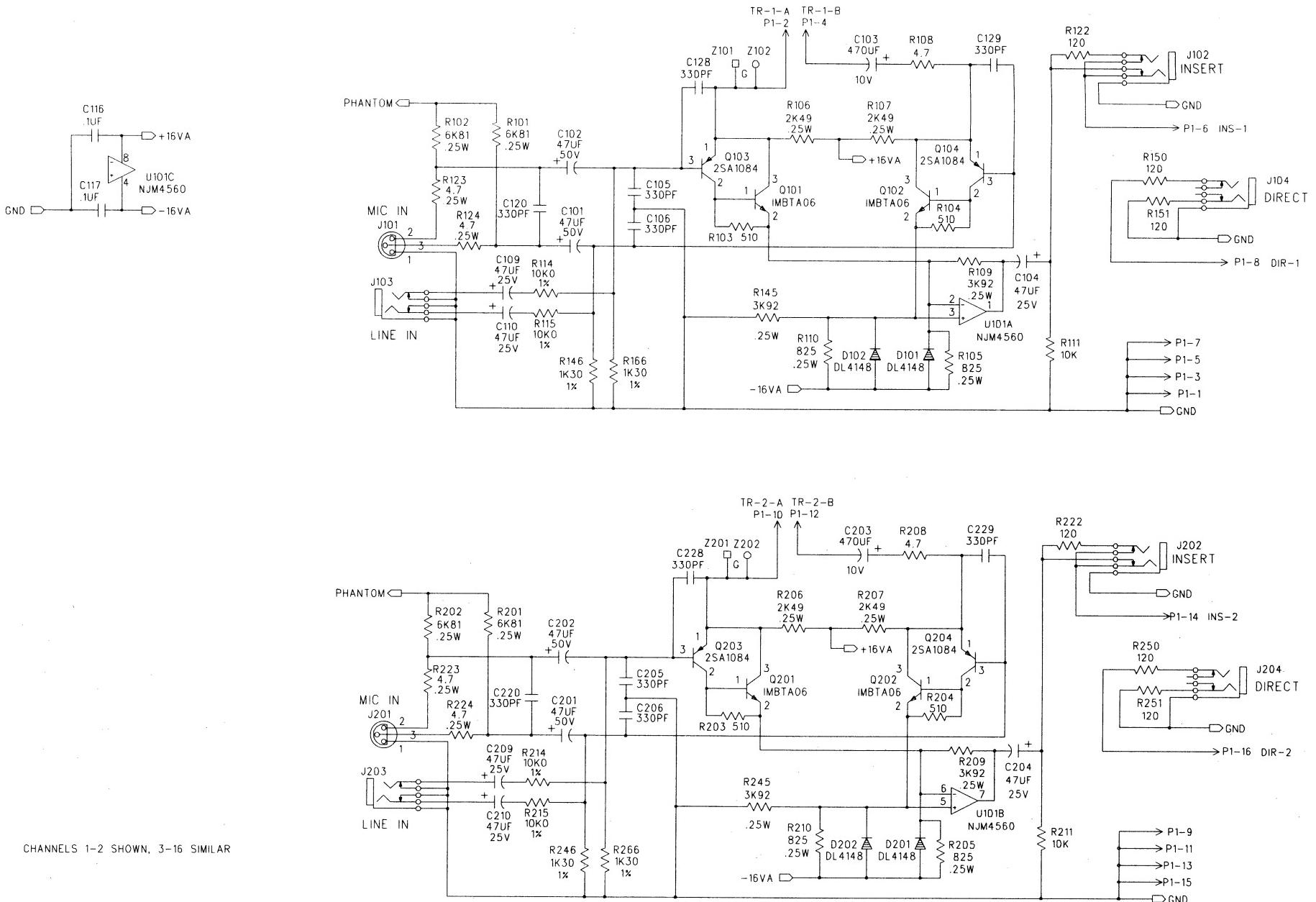
**OWNER'S MANUAL**  
820-034-01



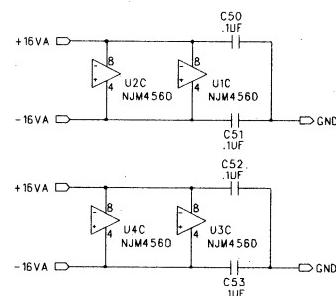
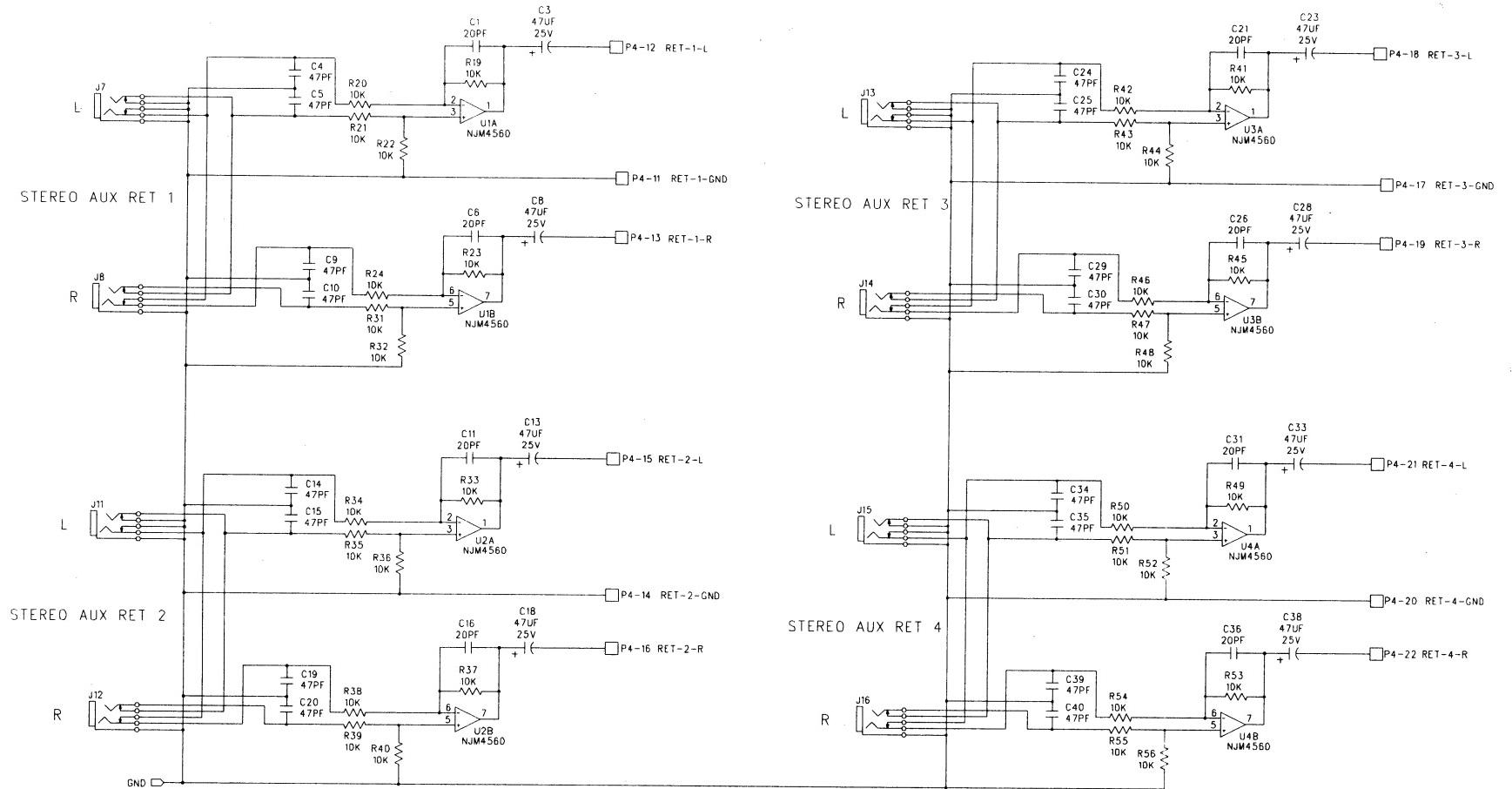


3

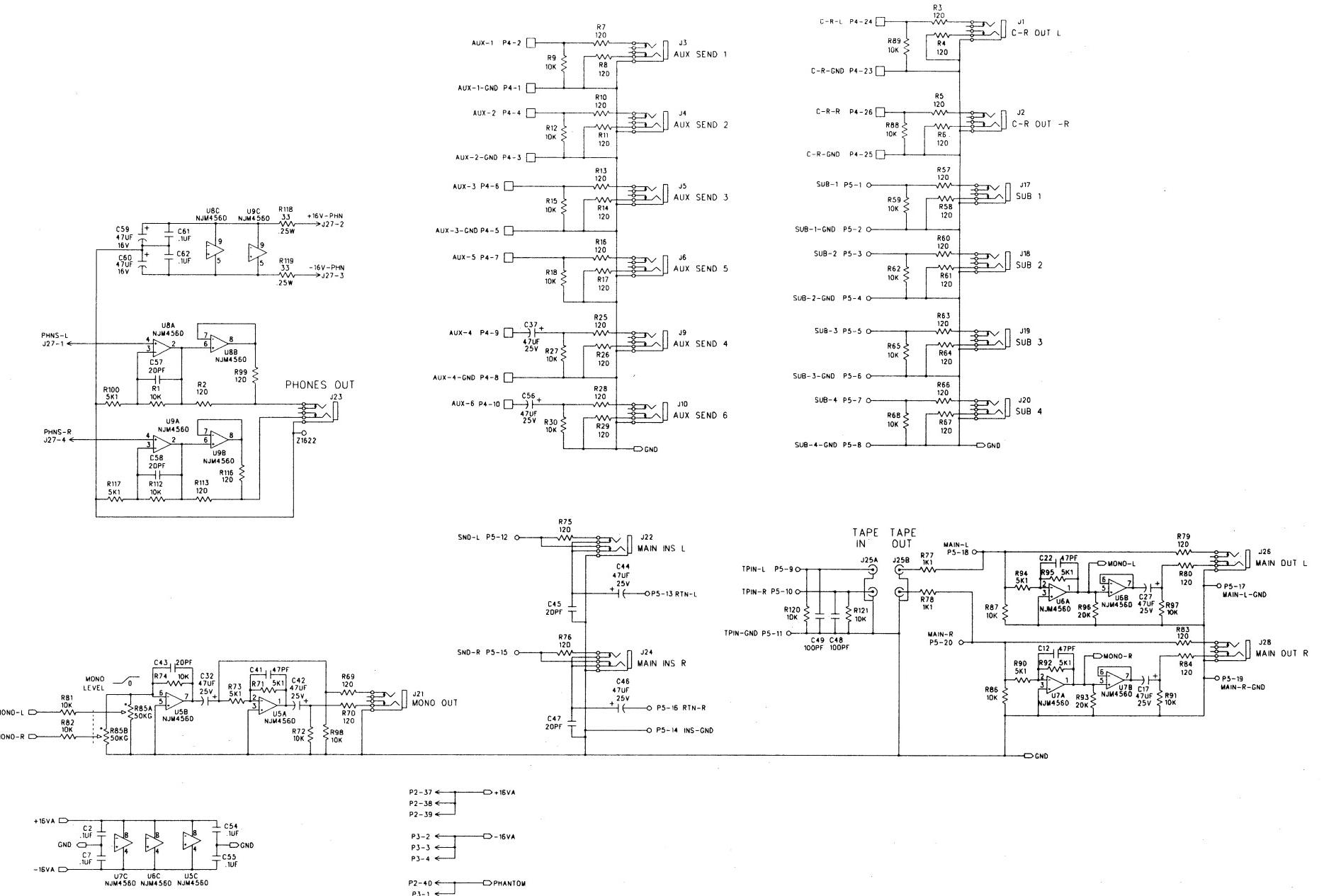
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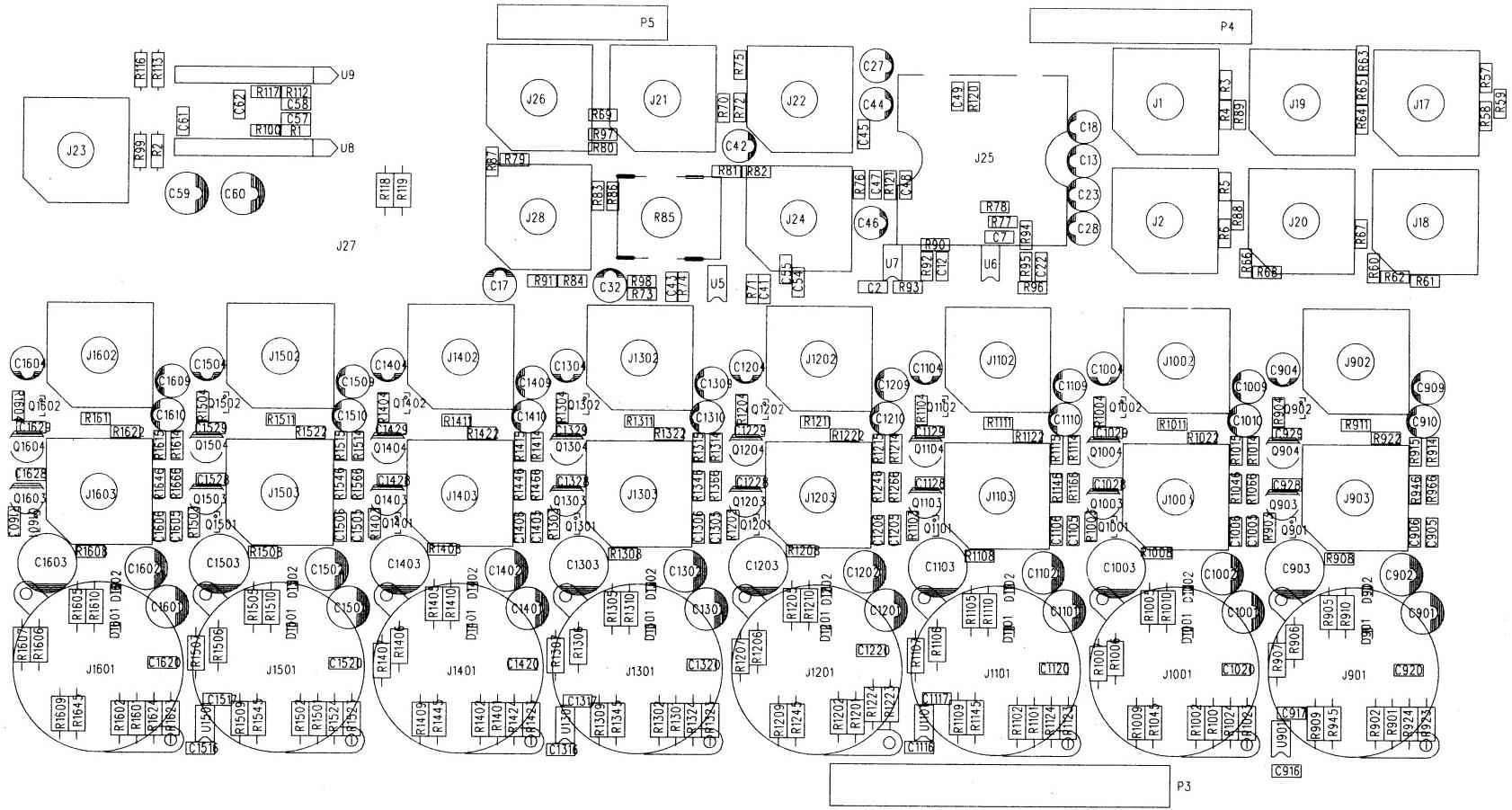
**MACKIE®**  
**CR1604-VLZ, POD SECTION SHEET 1**



**MACKIE**  
CR1604-VLZ, POD SECTION, SHEET 2

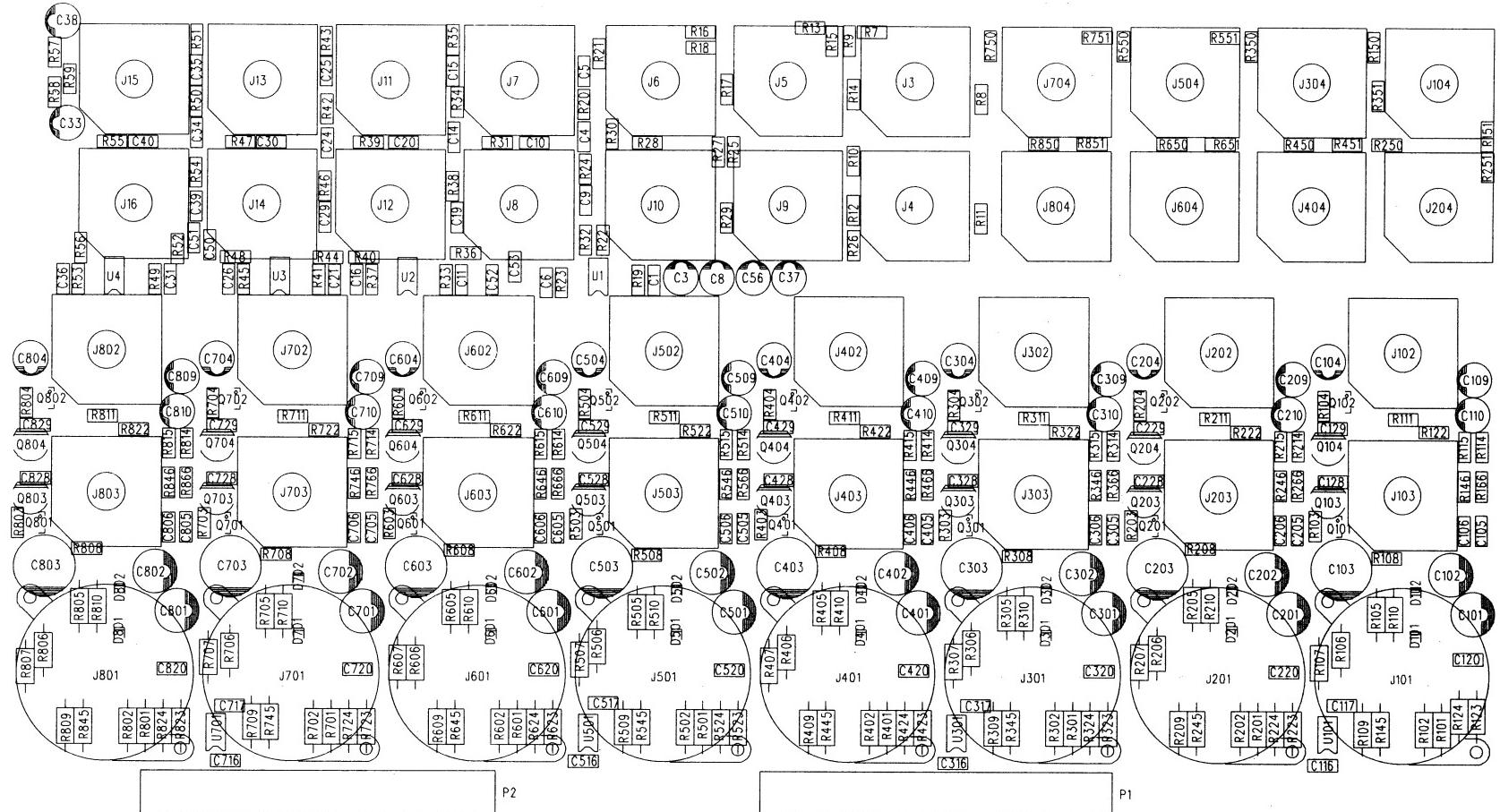


**MACKIE.**  
CR1604-VLZ POD SECTION, SHEET 3



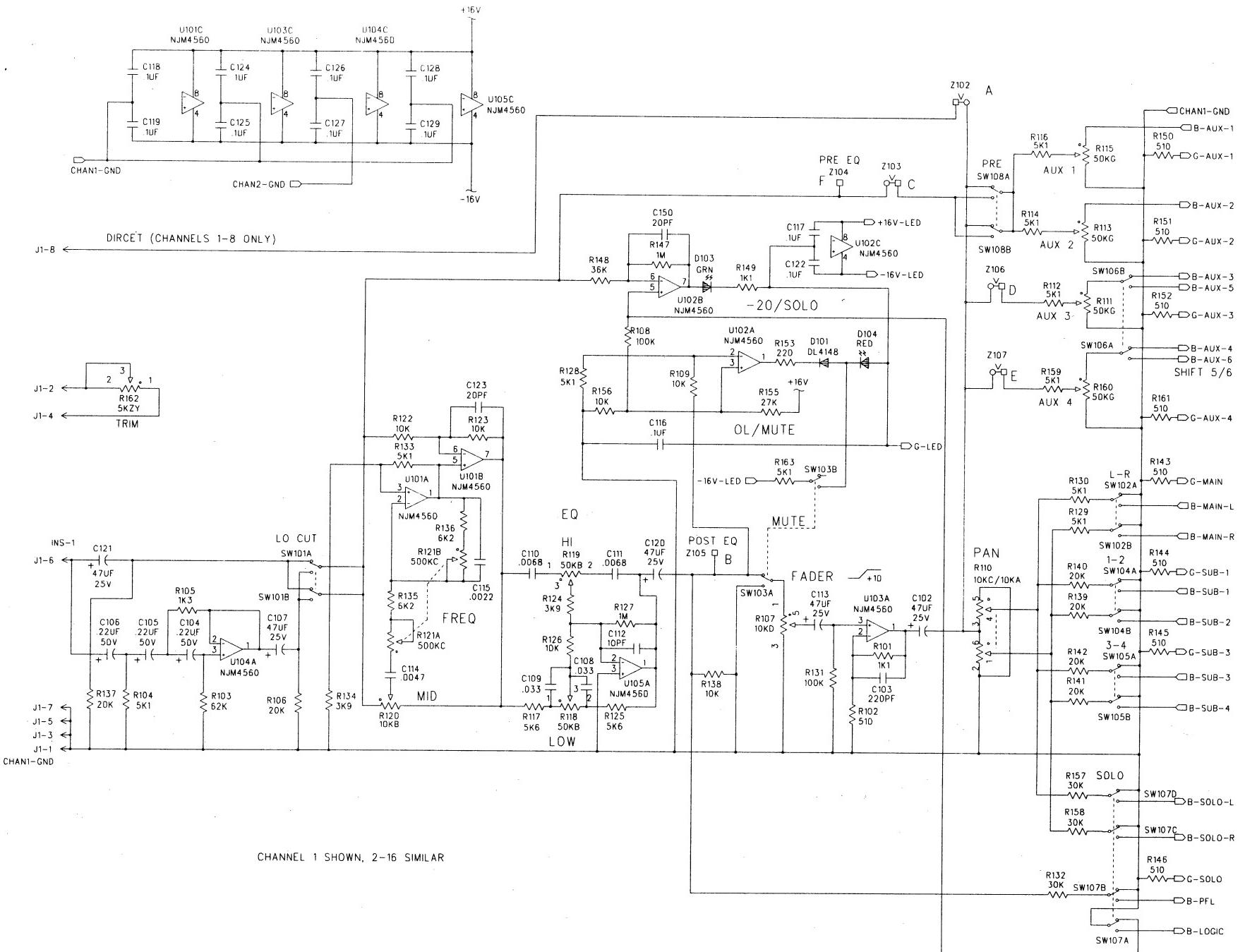
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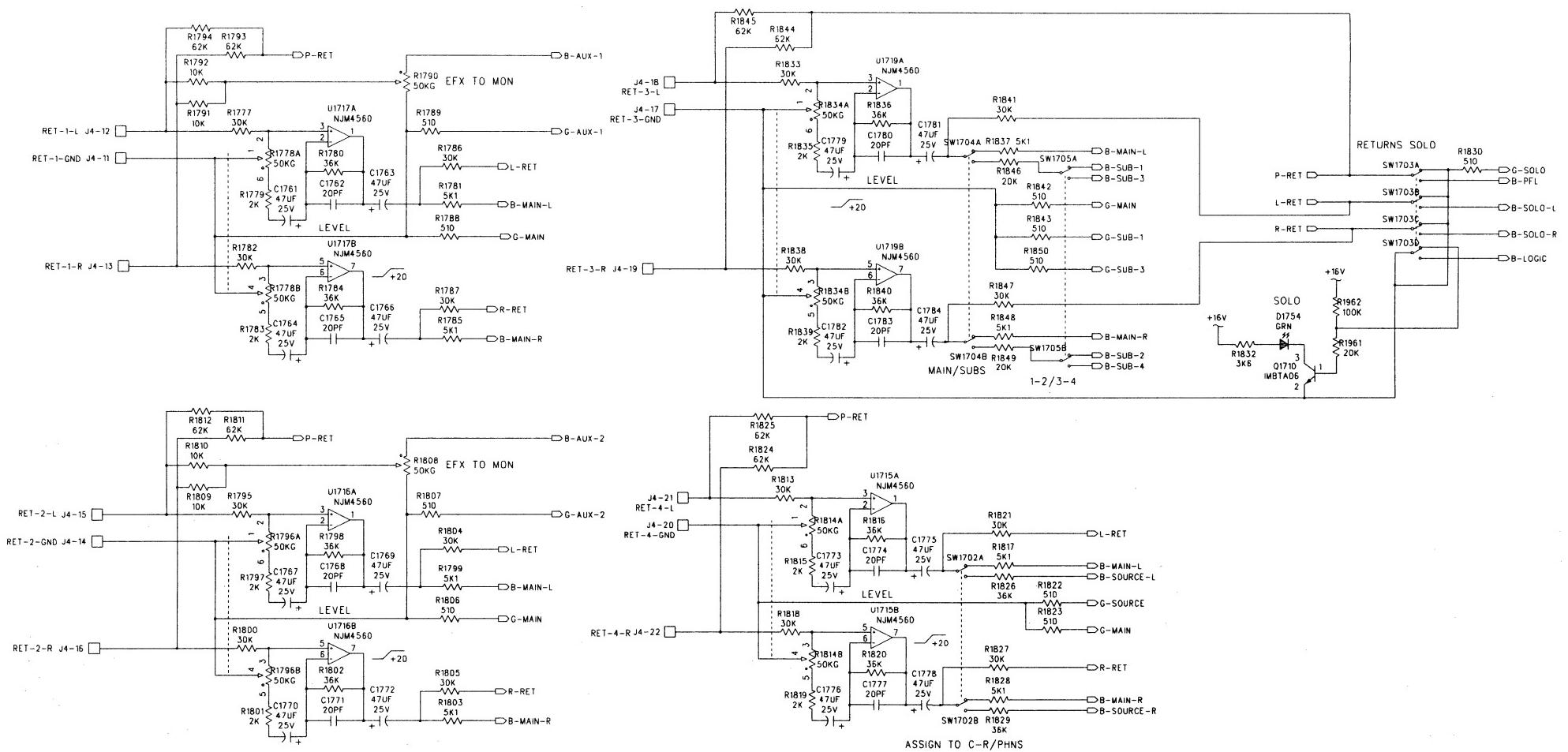
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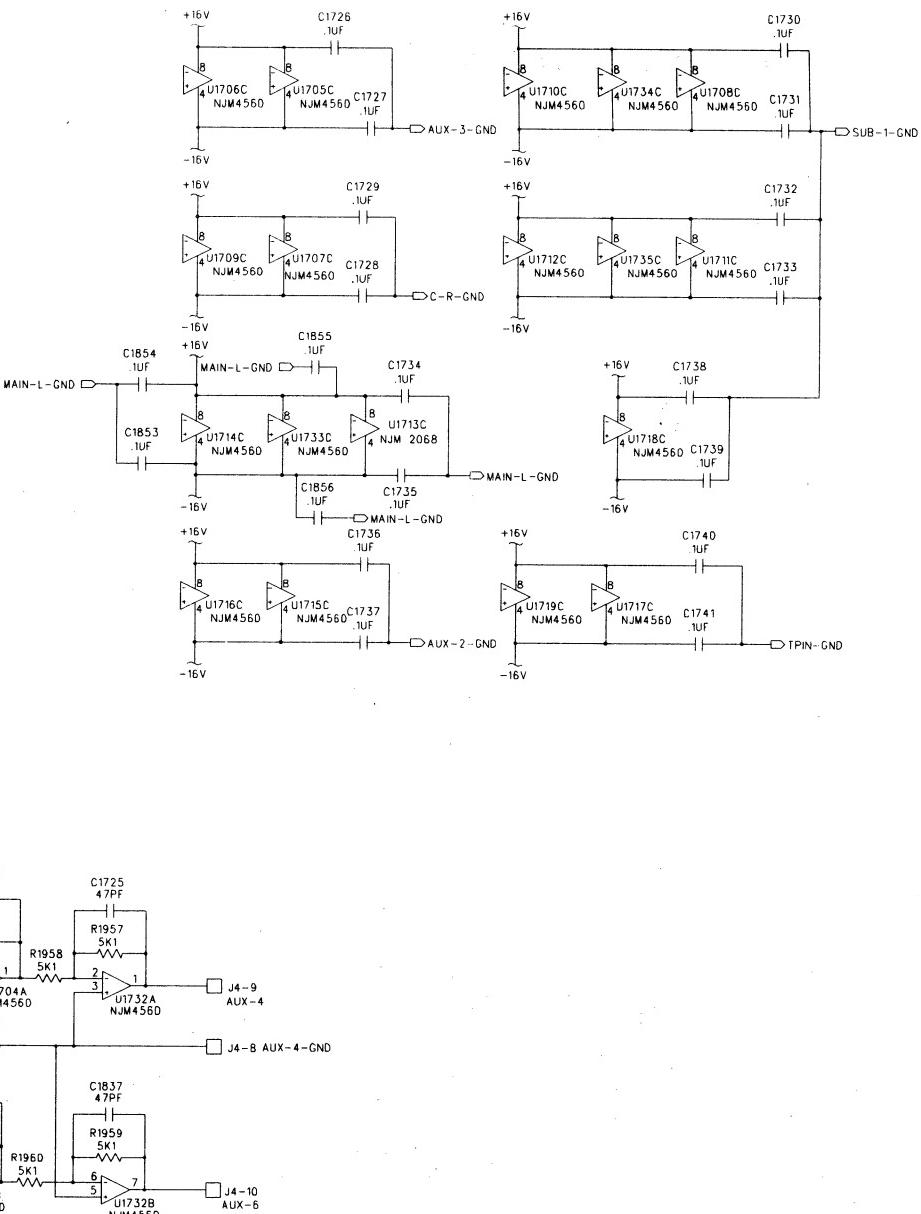
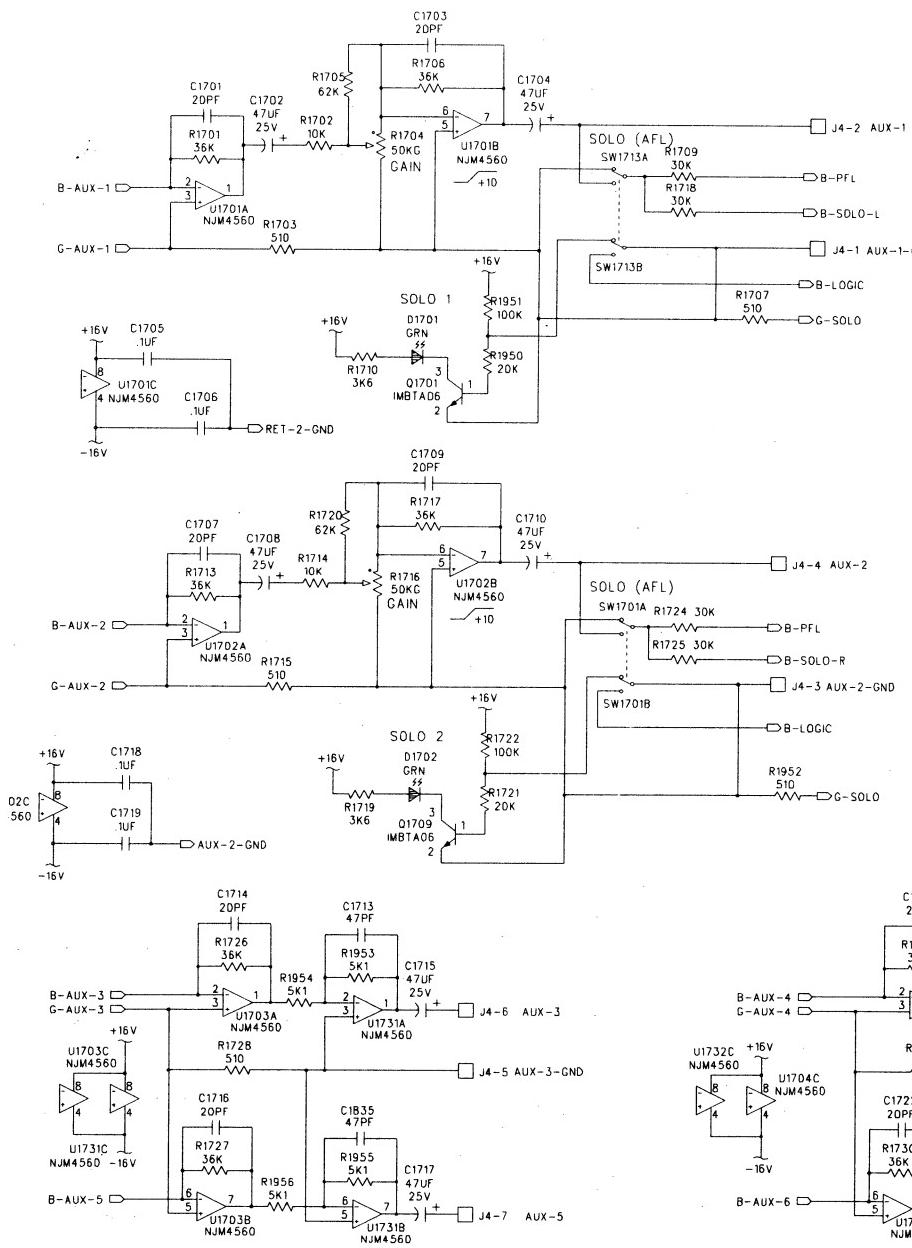
REV C

**MACKIE.**  
**CR1604-VLZ POD PCB LAYOUT, RIGHT HALF**

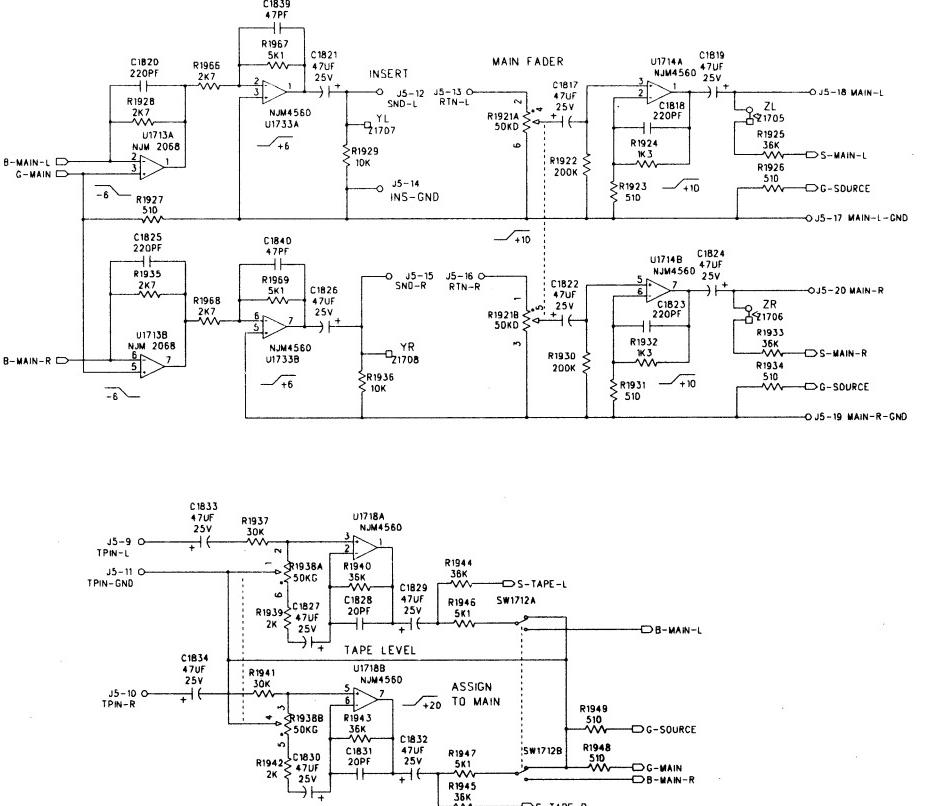
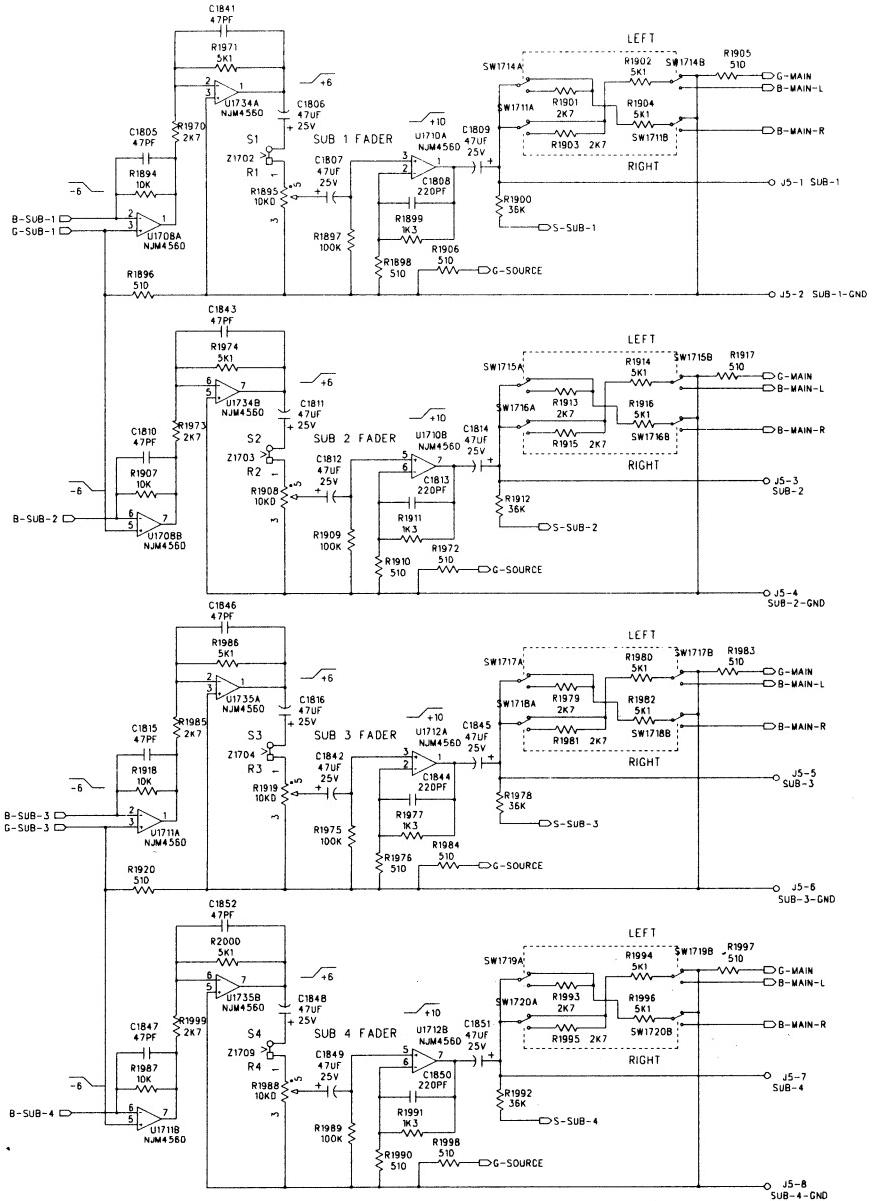




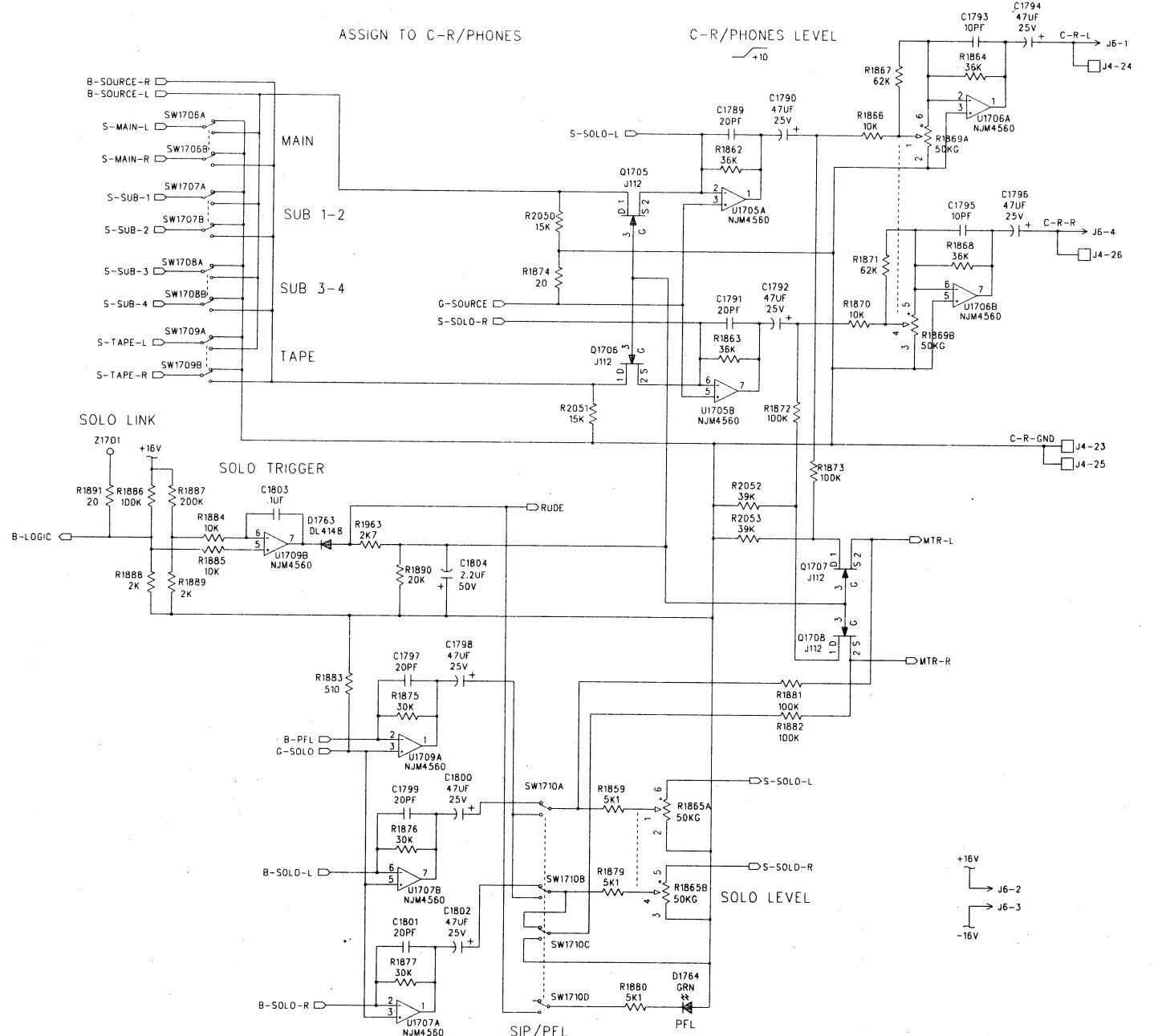
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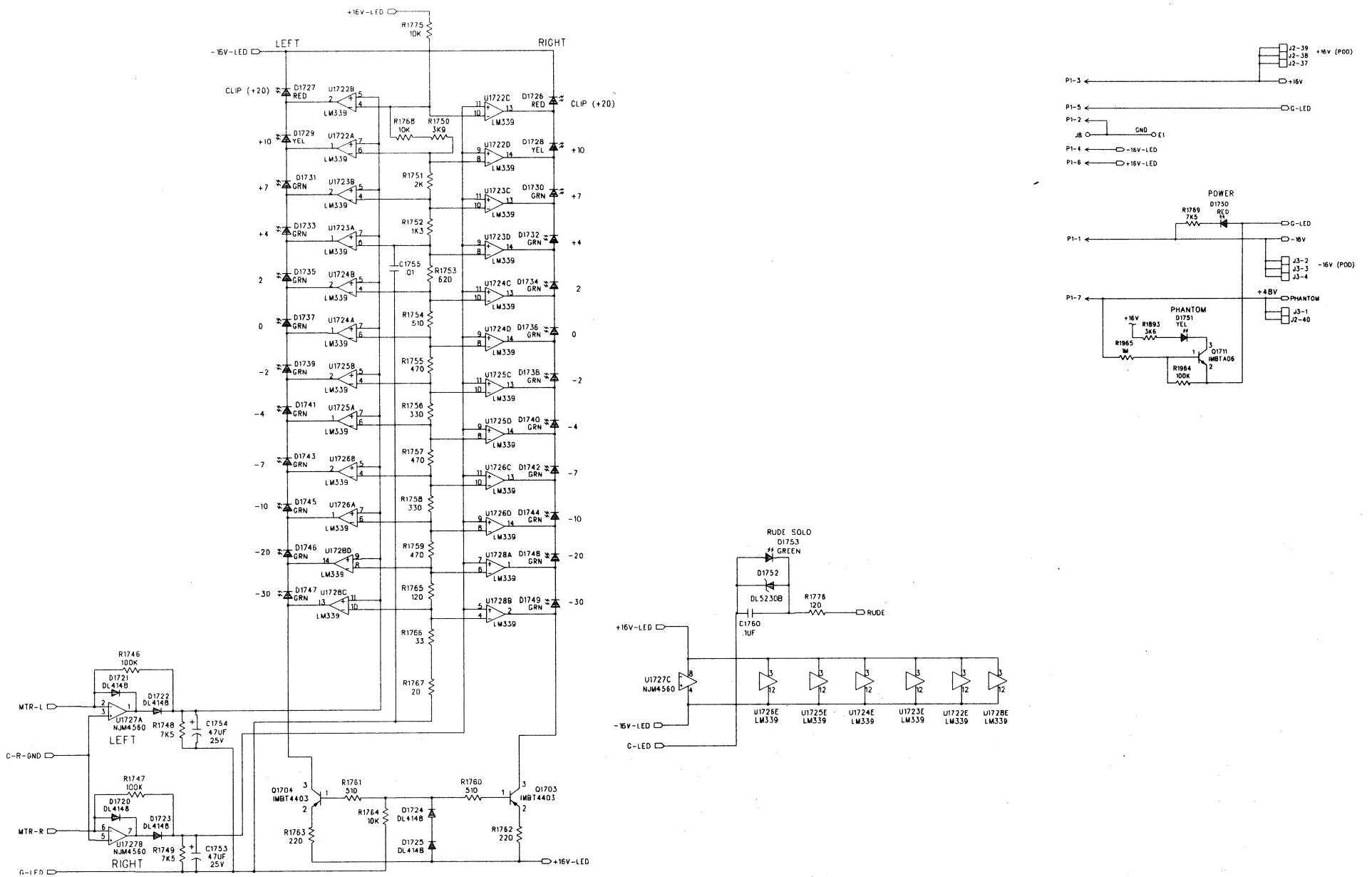
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**CR1604-VLZ MAIN SECTION, SHEET 3**



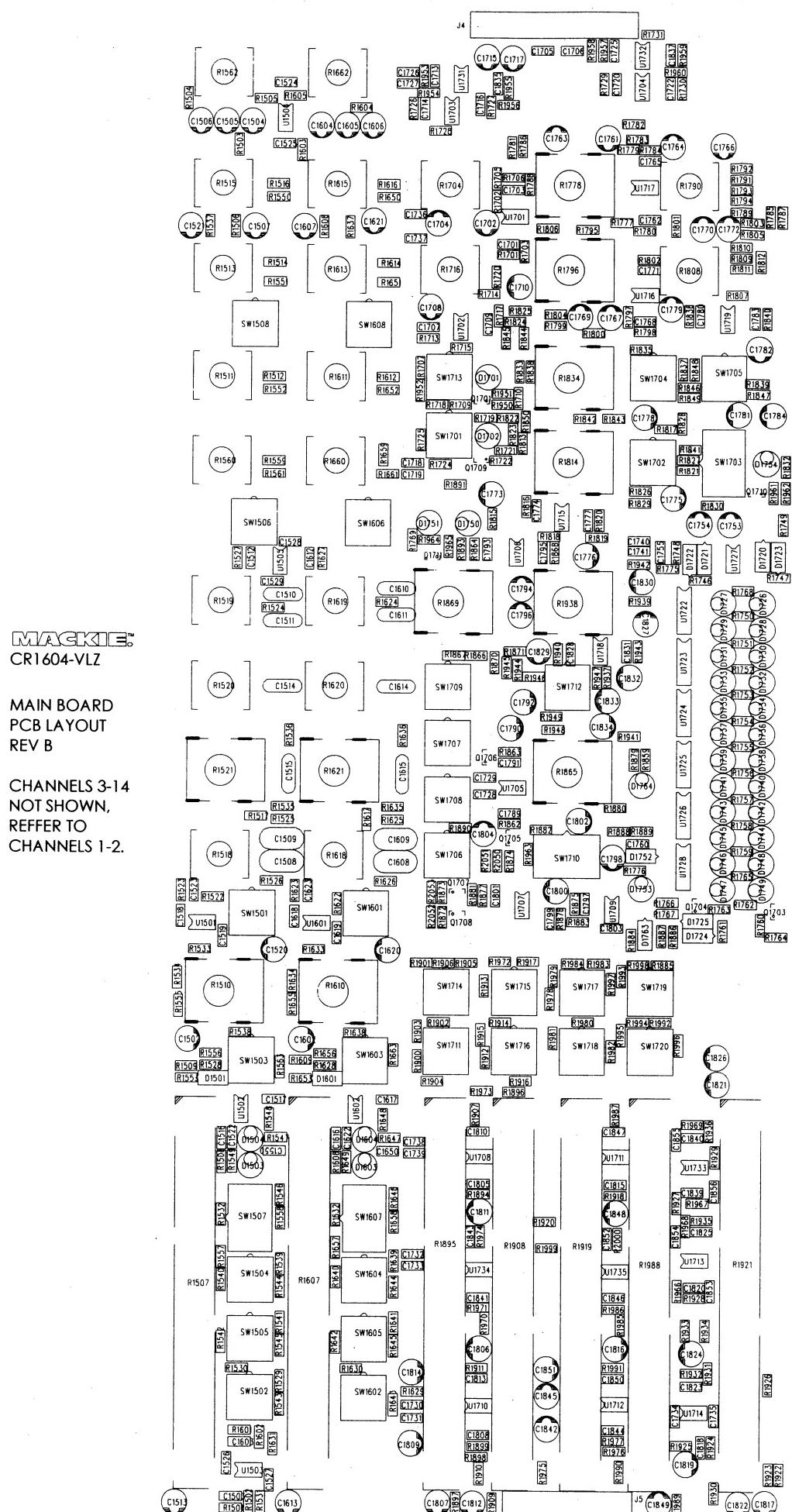
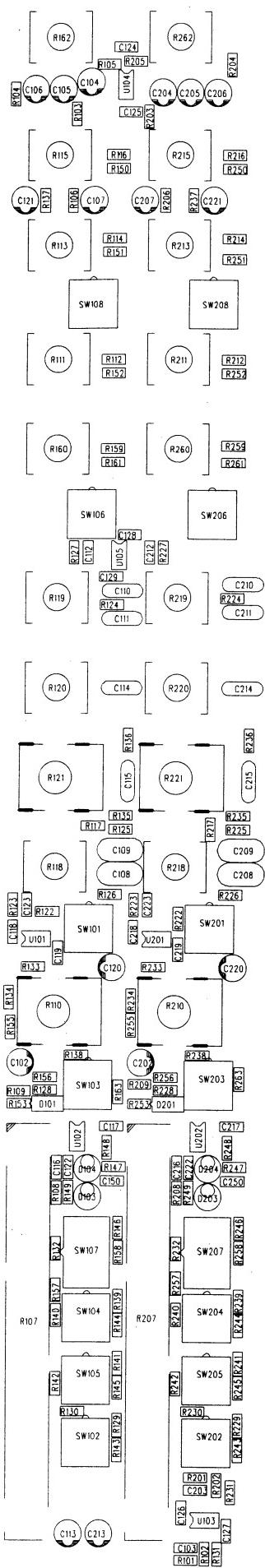
**MACKIE.**  
CR1604-VLZ MAIN SECTION, SHEET 4



**MACKIE**  
CR1604-VLZ MAIN SECTION, SHEET 5



**MACKIE.**  
**CR1604-VLZ MAIN SECTION, SHEET 6**



MACKIE™

**CR1604-VLZ  
MAIN PCB**

**JUMPER LOCATION  
AND PINOUT**

**J1**  
40 PIN  
MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**J2**  
40 PIN  
MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**J3**  
40 PIN  
MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**P1**  
POWER DISTRIBUTION  
CABLE ASSY PART # 040-078-00

**J4**  
26 PIN  
MAIN CABLE PART # 040-074-00  
POD CABLE PART # 040-071-00

**J5**  
20 PIN  
MAIN CABLE PART # 040-075-00  
POD CABLE PART # 040-072-00

SUB 1 OUT 1 2 SUB 1 GND  
SUB 2 OUT 3 4 SUB 2 OUT  
SUB 3 OUT 5 6 SUB 3 GND  
SUB 4 OUT 7 8 SUB 4 GND  
TAPE IN LEFT 9 10 TAPE IN RIGHT  
TAPE IN GND 11 12 LEFT MAIN INS SEND  
LEFT MAIN INS RETURN 13 14 INSERT GND  
RIGHT MAIN INS RTN 15 16 RIGHT MAIN INS SEND  
MAIN L GND 17 18 MAIN L TO POD  
MAIN R GND 19 20 MAIN R TO POD

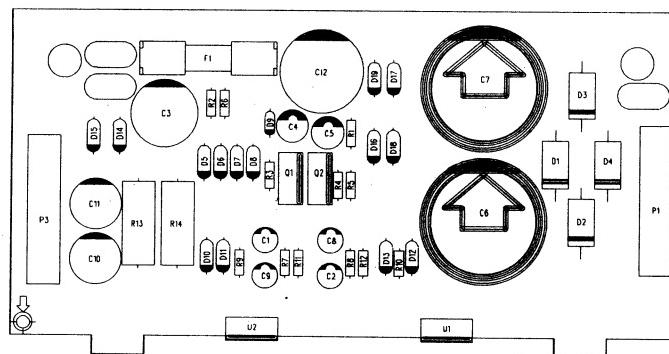
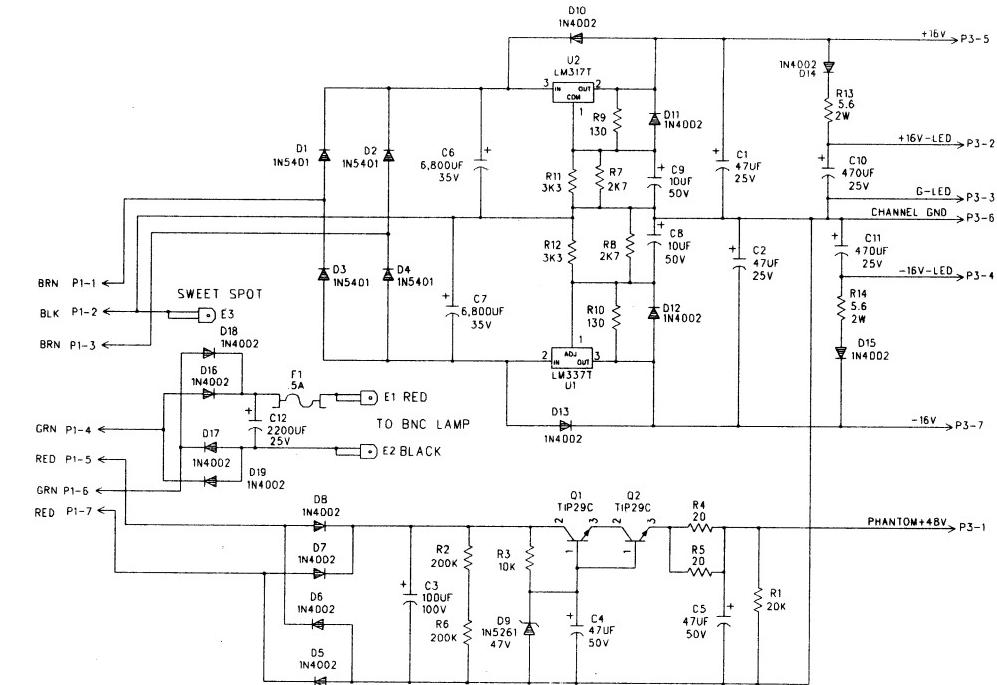
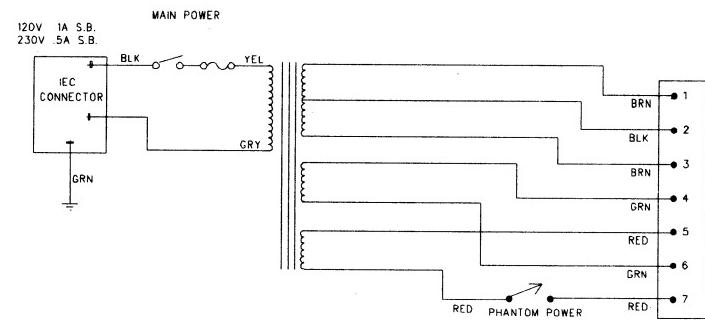
7	+48V PHANTOM
6	+16V LED
5	GND LED
4	-16V LED
3	+16V
2	GND
1	-16V

AUX 1 SEND GND 1	AUX 1 SEND 2
AUX 2 SEND GND 3	AUX 2 SEND 4
AUX 3/5 SEND GND 5	AUX 3 SEND 6
AUX 5 SEND 7	AUX 4&6 SEND GND 8
AUX 4 SEND 9	AUX 6 SEND 10
AUX RETURN 1 GND 11	AUX RETURN 1 LEFT 12
AUX RETURN 1 RIGHT 13	AUX RETURN 2 GND 14
AUX RETURN 2 LEFT 15	AUX RETURN 2 RIGHT 16
AUX RETURN 3 GND 17	AUX RETURN 3 LEFT 18
AUX RETURN 3 RIGHT 19	AUX RETURN 4 GND 20
AUX RETURN 4 LEFT 21	AUX RETURN 4 RIGHT 22
CONTROL ROOM GND 23	CONTROL ROOM LEFT 24
CONTROL ROOM GND 25	CONTROL ROOM RIGHT 26

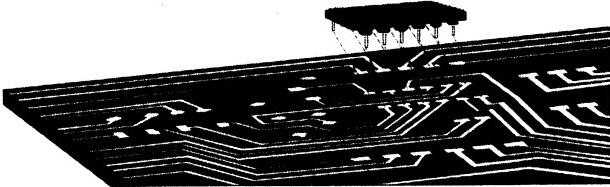
CHANNEL 1 GND 1	2	CHANNEL 1 TRIM A
CHANNEL 1 GND 3	4	CHANNEL 1 TRIM B
CHANNEL 1 GND 5	6	CHANNEL 1 IN
CHANNEL 1 GND 7	8	CHANNEL 1 DI OUT
CHANNEL 2 GND 9	10	CHANNEL 2 TRIM A
CHANNEL 2 GND 11	12	CHANNEL 2 TRIM B
CHANNEL 2 GND 13	14	CHANNEL 2 IN
CHANNEL 2 GND 15	16	CHANNEL 2 DI OUT
CHANNEL 3 GND 17	18	CHANNEL 3 TRIM A
CHANNEL 3 GND 19	20	CHANNEL 3 TRIM B
CHANNEL 3 GND 21	22	CHANNEL 3 IN
CHANNEL 3 GND 23	24	CHANNEL 3 DI OUT
CHANNEL 4 GND 25	26	CHANNEL 4 TRIM A
CHANNEL 4 GND 27	28	CHANNEL 4 TRIM B
CHANNEL 4 GND 29	30	CHANNEL 4 IN
CHANNEL 4 GND 31	32	CHANNEL 4 DI OUT
CHANNEL 5 GND 33	34	CHANNEL 5 TRIM A
CHANNEL 5 GND 35	36	CHANNEL 5 TRIM B
CHANNEL 5 GND 37	38	CHANNEL 5 IN
CHANNEL 5 GND 39	40	CHANNEL 5 DI OUT

CHANNEL 6 GND 1	2	CHANNEL 6 TRIM A
CHANNEL 6 GND 3	4	CHANNEL 6 TRIM B
CHANNEL 6 GND 5	6	CHANNEL 6 IN
CHANNEL 6 GND 7	8	CHANNEL 6 DI OUT
CHANNEL 7 GND 9	10	CHANNEL 7 TRIM A
CHANNEL 7 GND 11	12	CHANNEL 7 TRIM B
CHANNEL 7 GND 13	14	CHANNEL 7 IN
CHANNEL 7 GND 15	16	CHANNEL 7 DI OUT
CHANNEL 8 GND 17	18	CHANNEL 8 TRIM A
CHANNEL 8 GND 19	20	CHANNEL 8 TRIM B
CHANNEL 8 GND 21	22	CHANNEL 8 IN
CHANNEL 8 GND 23	24	CHANNEL 8 DI OUT
CHANNEL 9 GND 25	26	CHANNEL 9 TRIM A
CHANNEL 9 GND 27	28	CHANNEL 9 TRIM B
CHANNEL 9 GND 29	30	CHANNEL 9 IN
CHANNEL 10 GND 31	32	CHANNEL 10 TRIM A
CHANNEL 10 GND 33	34	CHANNEL 10 TRIM B
CHANNEL 10 GND 35	36	CHANNEL 10 IN
+16 V 37	38	+16 V
+16 V 39	40	+48V PHANTOM PWR

+48V PHANTOM PWR 1	2	-16V
-16V 3	4	-16V
CHANNEL 11 GND 5	6	CHANNEL 11 TRIM A
CHANNEL 11 GND 7	8	CHANNEL 11 TRIM B
CHANNEL 11 GND 9	10	CHANNEL 11 IN
CHANNEL 12 GND 11	12	CHANNEL 12 TRIM A
CHANNEL 12 GND 13	14	CHANNEL 12 TRIM B
CHANNEL 12 GND 15	16	CHANNEL 12 IN
CHANNEL 13 GND 17	18	CHANNEL 13 TRIM A
CHANNEL 13 GND 19	20	CHANNEL 13 TRIM B
CHANNEL 13 GND 21	22	CHANNEL 13 IN
CHANNEL 14 GND 23	24	CHANNEL 14 TRIM A
CHANNEL 14 GND 25	26	CHANNEL 14 TRIM B
CHANNEL 14 GND 27	28	CHANNEL 14 IN
CHANNEL 15 GND 29	30	CHANNEL 15 TRIM A
CHANNEL 15 GND 31	32	CHANNEL 15 TRIM B
CHANNEL 15 GND 33	34	CHANNEL 15 IN
CHANNEL 16 GND 35	36	CHANNEL 16 TRIM A
CHANNEL 16 GND 37	38	CHANNEL 16 TRIM B
CHANNEL 16 GND 39	40	CHANNEL 16 IN



**MACKIE.**  
**CR1604-VLZ**  
**POWER SUPPLY**



## THE MACKIE FIXER • MACKIE DESIGNS SERVICE NEWS

### 1604-VLZ Auxiliary modifications

In addition to the modifications shown in the 1604-VLZ owner's manual, there are two rather lovely and optional mods for the signal routing of Aux 3/4 and 5/6.

#### **UL Warning**

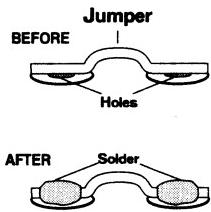
**CAUTION!** These modification instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than changing the fuse unless you are qualified to do so. Refer all servicing and modifying to qualified personnel.

#### **Mackie Disclaimer**

Any modification of any Mackie Designs product must be performed by a competent electronic technician. Mackie Designs accepts no responsibility for any damages or injuries caused by any modification, regardless of the source of the modification instructions or the qualifications of the technician performing them. In the case of such damages, Mackie Designs may declare warranty privileges void. **BE CAREFUL!**

#### **About Jumpers**

We recommend solid (non-stranded) insulated wire, 26-28 gauge (wire-wrapping variety). When installing jumpers, do not run their ends through holes in the circuit board. Rather, solder them flat against the desired pad (the flat silver area, possibly with a hole in the middle). Make sure the ends of these flat wires do not extend beyond the pad.



#### **Tools required**

Sharp razor (X-acto) knife, soldering iron, solder, Phillips screwdriver.

#### **Getting ready**

The following must be performed before starting the actual mods.

1. Remove all cords, including the power cable, from the 1604-VLZ.
2. Place the mixer upside-down on a dry, non-marring surface.
3. If you have converted your mixer to the rack-mount position or have installed a RotoPod, undo those changes and temporarily configure the mixer in the original desktop mode. You do not have to install the pod, just get it out of the way of the bottom cover.
4. Remove the screws that attach the bottom cover. Keep track of what screws go where. Remove the bottom cover and have at the mods shown on sheet 2.
5. When you have finished the mods, put it all back together and retest all functions for correct operation, making especially sure that all modified channels are working correctly.

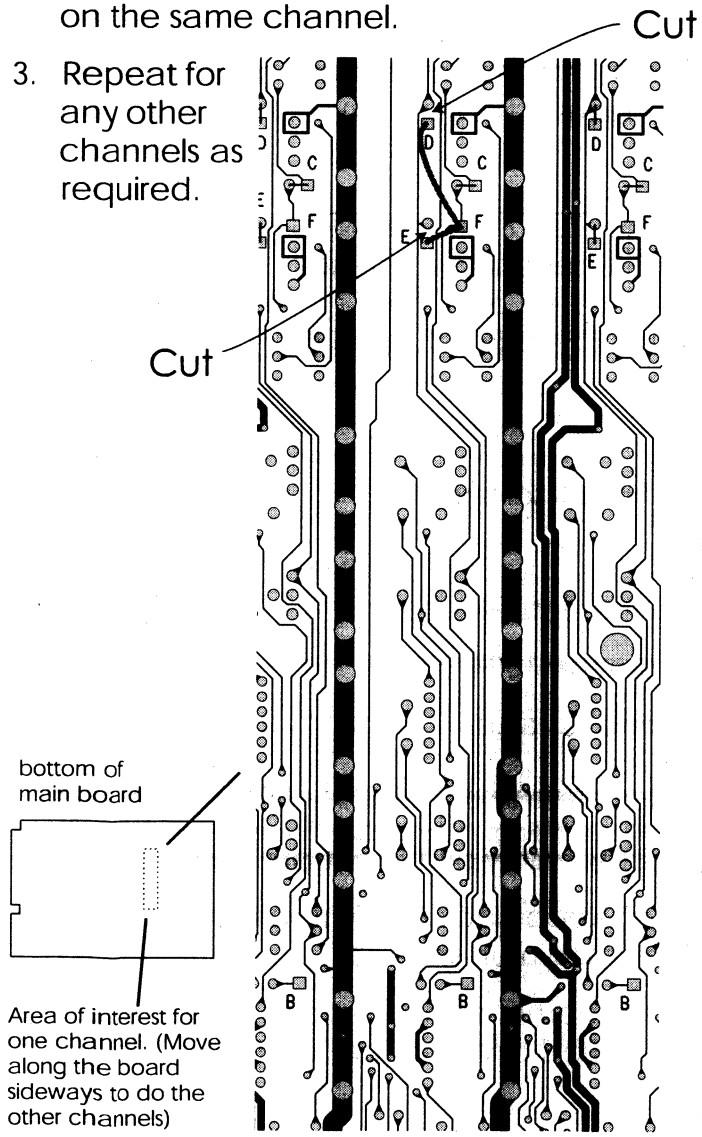
To make Aux 3/5 and Aux4/6  
Pre-EQ and Pre-Fader

### Aux 3/5

1. Cut the trace between the round and square pads at point **D** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **D** to the square pad at **F** on the same channel.
3. Repeat for other channels as required.

### Aux 4/6

1. Cut the trace between the round and square pads at point **E** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **E** to the square pad at **F** on the same channel.
3. Repeat for other channels as required.



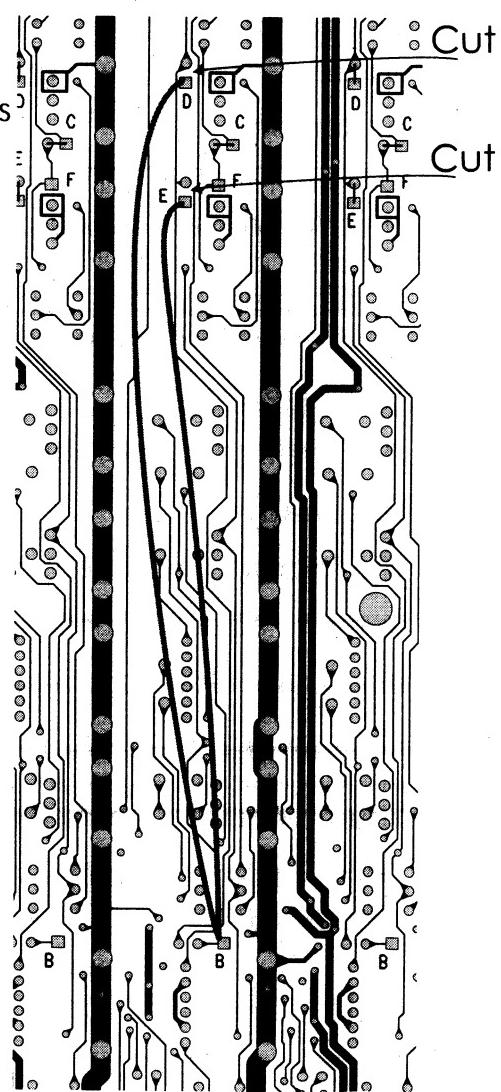
To make Aux 3/5 and Aux4/6  
Post-EQ and Pre-Fader

### Aux 3/5

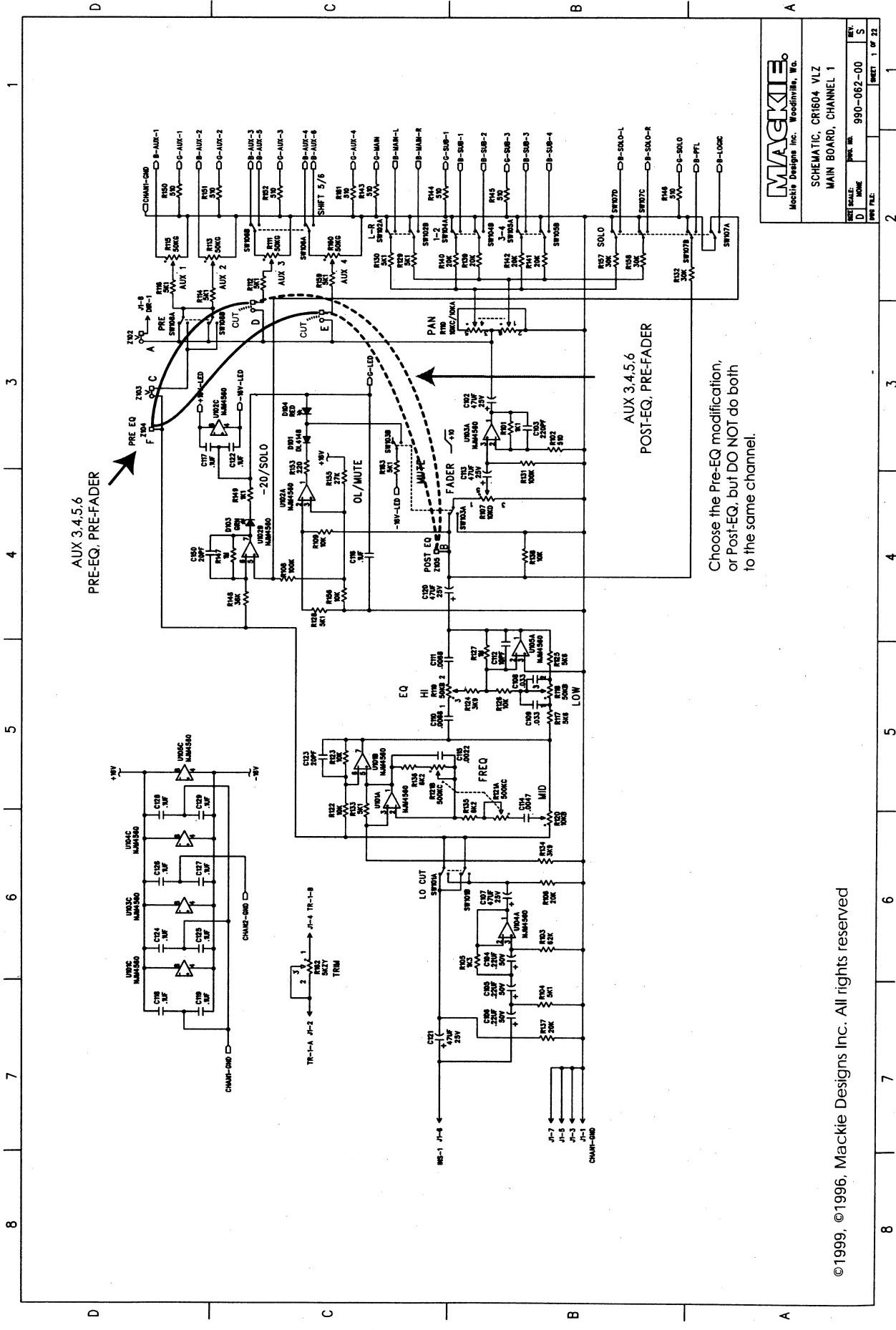
1. Cut the trace between the round and square pads at point **D** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **D** to the square pad at **B** on the same channel.
3. Repeat for other channels as required.

### Aux 4/6

1. Cut the trace between the round and square pads at point **E** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **E** to the square pad at **B** on the same channel.
3. Repeat for other channels as required.



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Choose the Pre-EQ modification, or Post-EQ, but DO NOT do both to the same channel.

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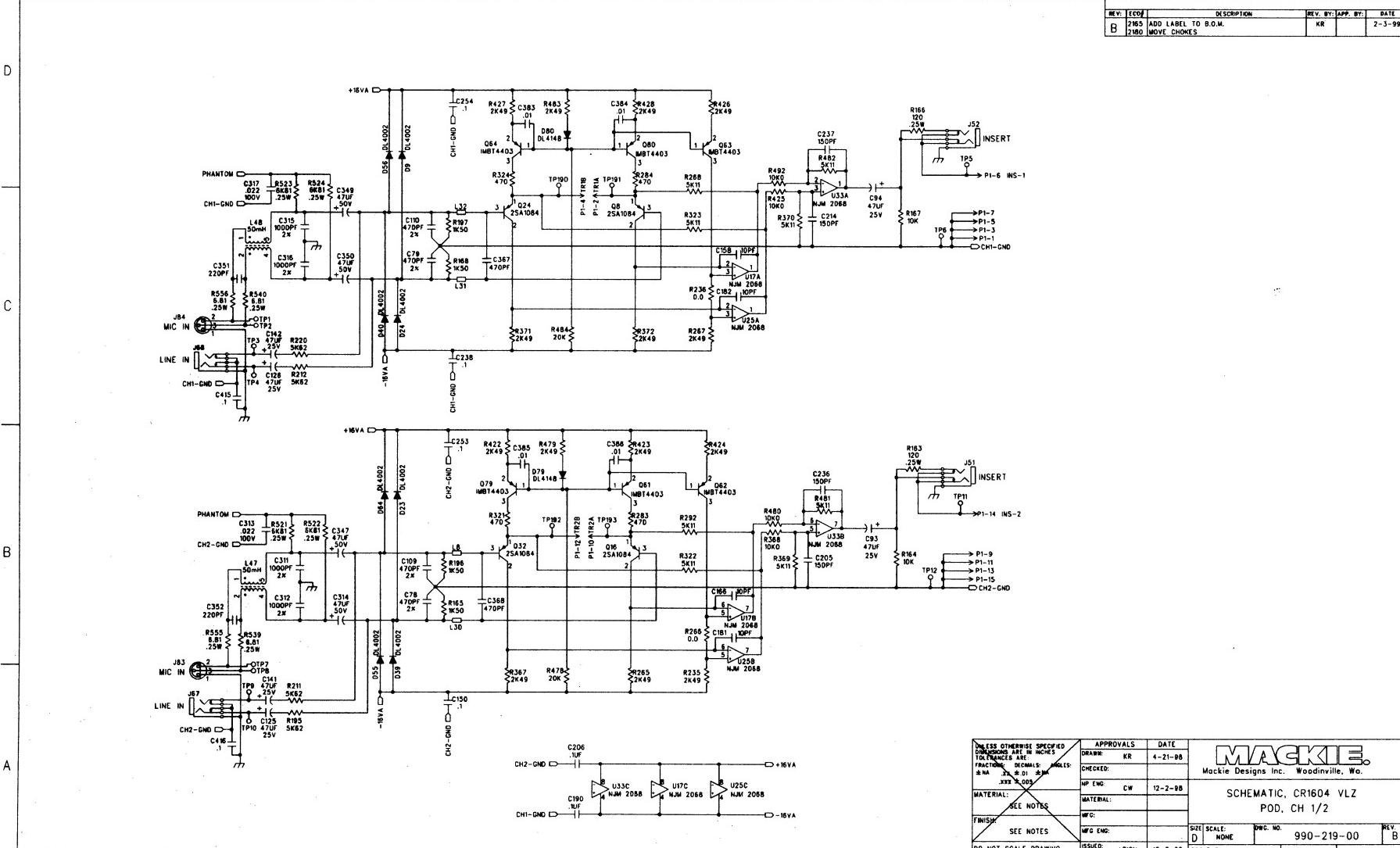
1604-VLZ Aux mod, sheet 3 of 3

**MACKIE DESIGNS CR-1604 VLZ PRO**

**REV 12-3-1998**

8 7 6 5 4 3 DWG NO 990-219-00 SHT REV B 1

REV: ECO	DESCRIPTION	REV. BY: APP. BY:	DATE:
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B	Z460 MOVE CHOKES		

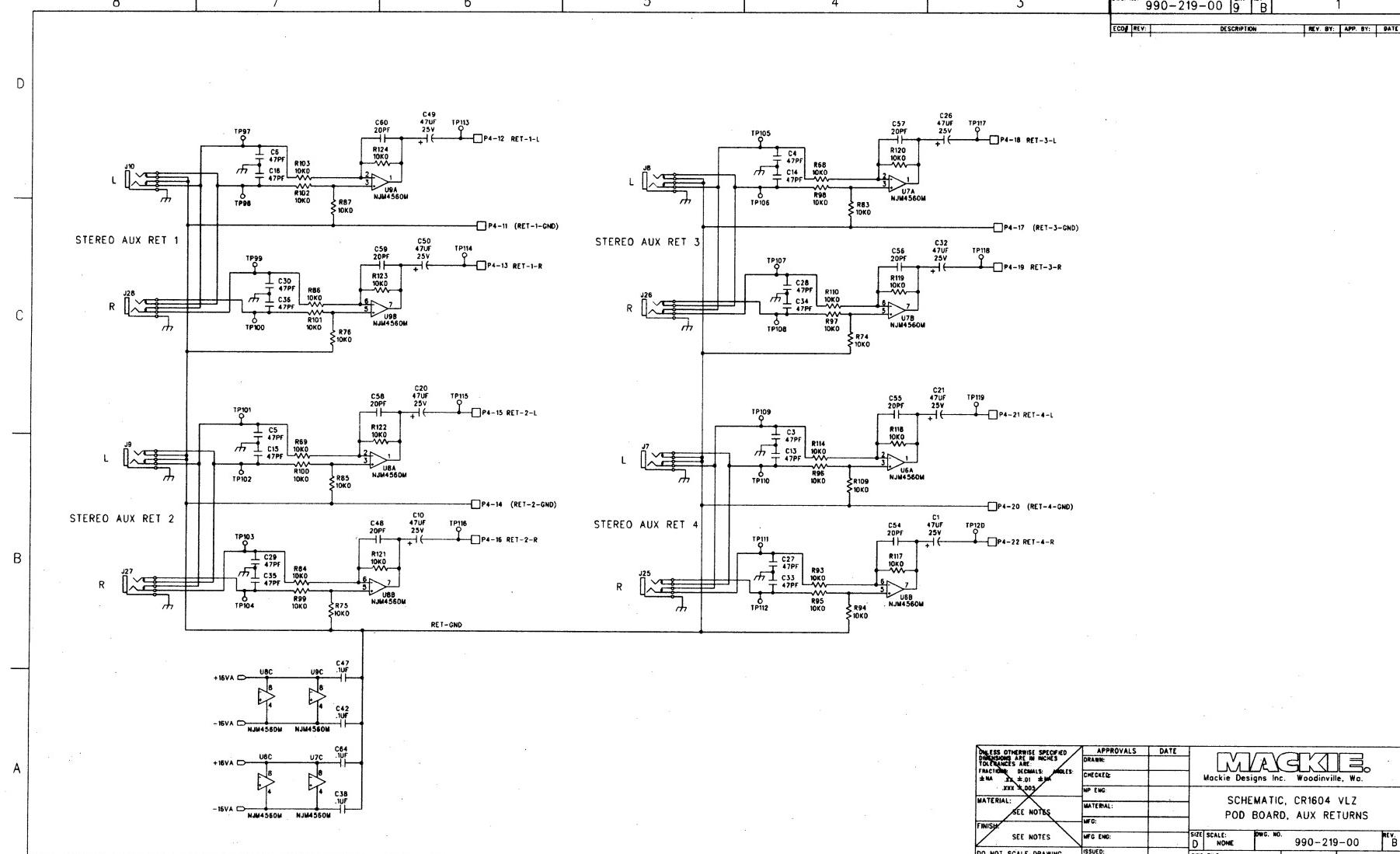


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FRACTIONAL DECIMALS:		CHECKED:	
		NP ENG: CW	12-2-98
MATERIAL:		MFC:	
FINISH:		MFG ENG:	
SEE NOTES		SIZE: D	SCALED: NONE
SEE NOTES		ISSUED: LEIGH	DWG. NO: 990-219-00
DO NOT SCALE DRAWING		REV: B	DWG FILE: SHEET 1 OF 10

**MACKIE**  
Mackie Designs Inc., Woodinville, Wa.

SCHEMATIC, CR1604 VLZ  
POD, CH 1/2

ECO# REV: DESCRIPTION REV BY APP BY DATE



APPROVALS		DATE
DRAWN:		
CHECKED:		
MP ENG:		
MATERIAL:		
FINISH:		
SEE NOTES		
DO NOT SCALE DRAWING		
MACKIE. Mackie Designs Inc. Woodinville, Wa.		
SCHEMATIC, CR1604 VLZ POD BOARD, AUX RETURNS		
SHEET 9 OF 10		

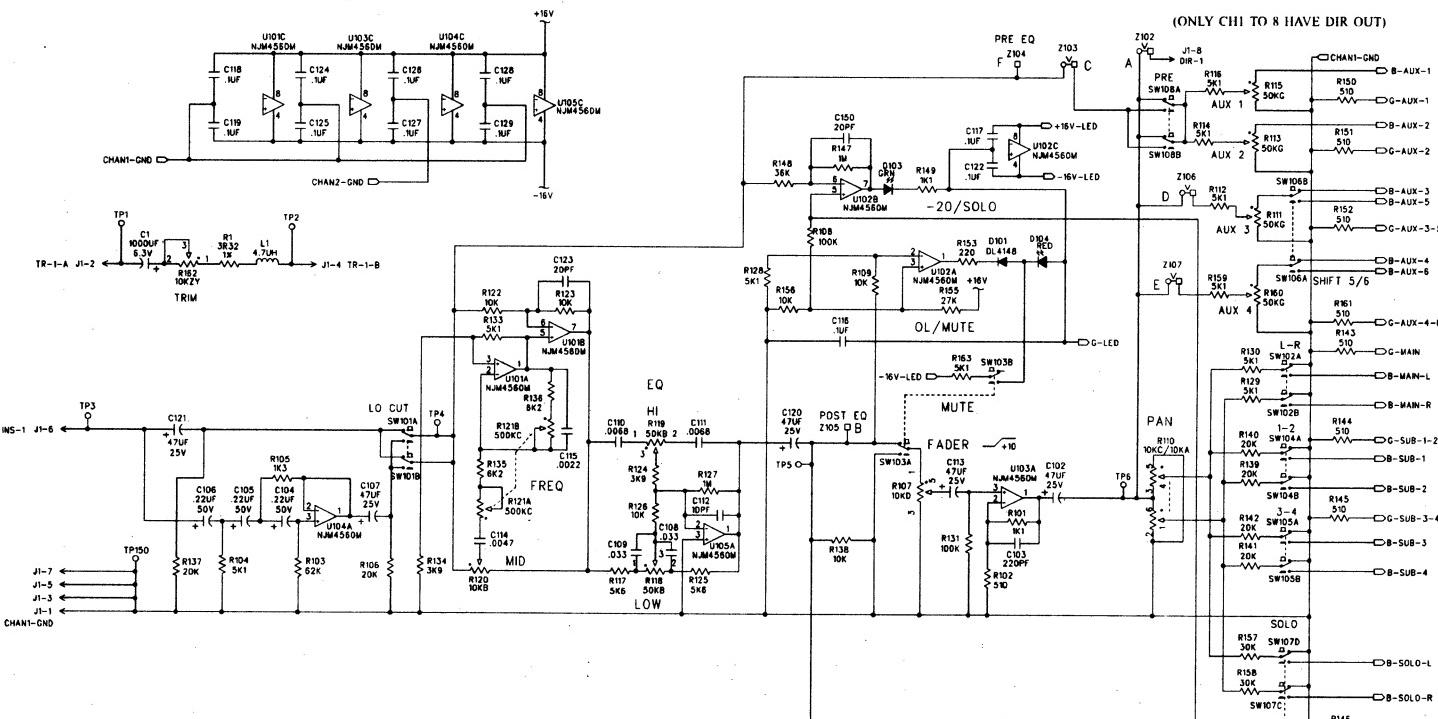
**MACKIE** 1604 VLZ PRO SERVICE MANUAL

219-3

POD BOARD 219 REV E

**MACKIE** 1604 VLZ PRO SERVICE MANUAL

D



Channel 1 is shown here, Channels 2 to 8 are similar, Channels 9-19 are also similar, but do not have the DIR OUT as shown in the top right of this schematic page.

UNLESS OTHERWISE SPECIFIED DRAWING IS IN INCHES TOLERANCES:		APPROVALS	DATE
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		CHECKED:	
		MP ENG	
<b>MATERIAL:</b>		MATERIAL:	Schematic, CR1604 VLZ
SEE NOTES		MFG:	MAIN BOARD, CHANNEL 1
<b>FINISH:</b>		MFG ENC:	SIZE: D
SEE NOTES		ISSUED:	SCALE: NONE
DO NOT SCALE DRAWING			DWG. NO. 990-220-00
			DWG. DATE
			SHEET 1 OF 22

8

1

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1

51-50

1

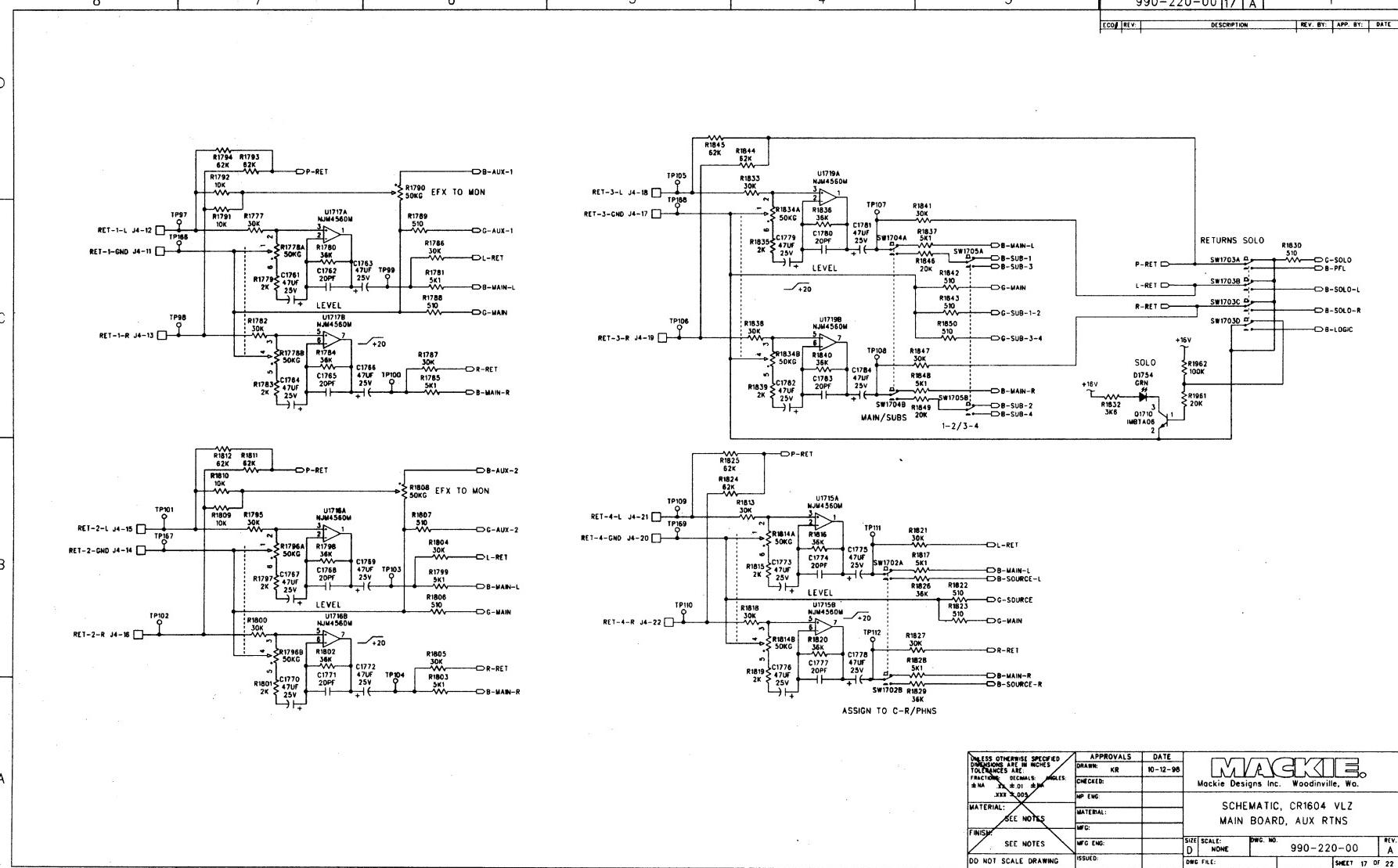
220-1

MAIN BOARD 220 REV A

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DWG NO 990-220-00 17 REV A

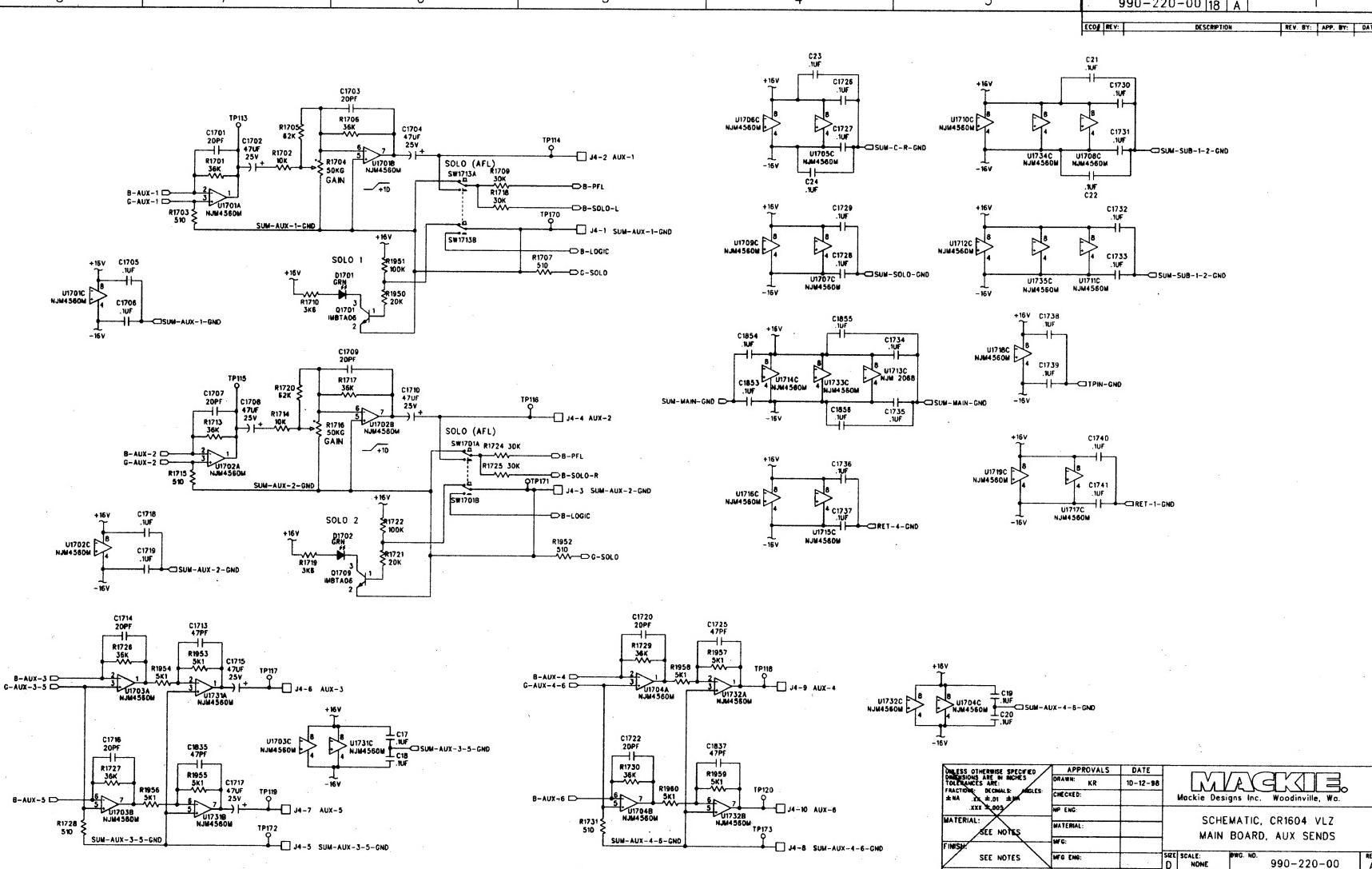
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**MACKIE** 1604 VLZ PRO SERVICE MANUAL

1

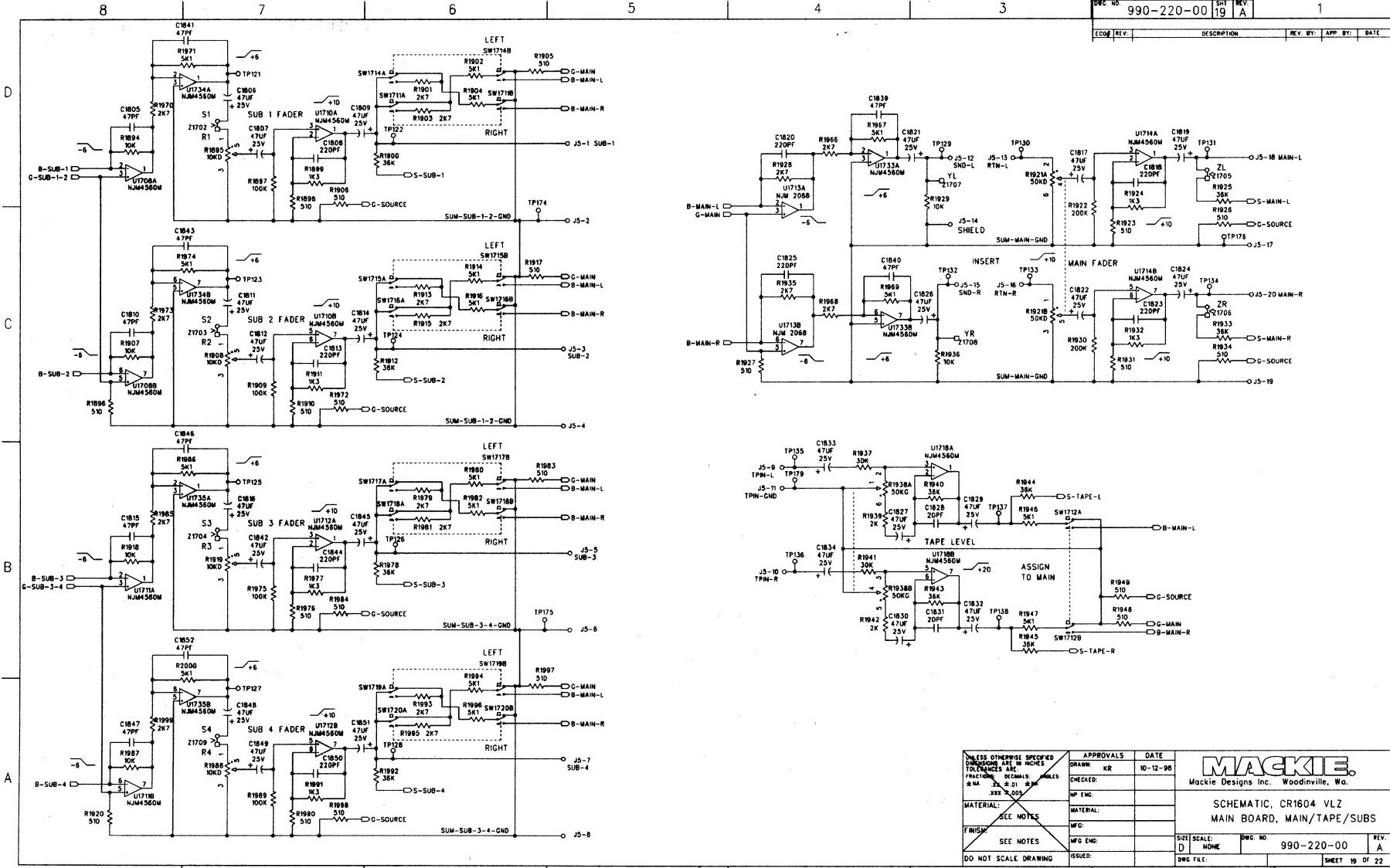
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220-3

MAIN BOARD 220 REV

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APPROVALS		DATE
DRAWN:	KR	10-12-96
CHECKED:		
MAKER:		
REMAINS:		
SPACES:		
INCHES:		
MM:		
ANGLES:		
XXX		
XXX		
XXX		
MATERIAL:		
SEE NOTES		
FINISH:		
SEE NOTES		
DD NOT SCALE DRAWING		

**MACKIE**  
Mackie Designs Inc. Woodinville, Wa.

SCHEMATIC, CR1604 VLZ  
MAIN BOARD, MAIN/TAPE/SUBS

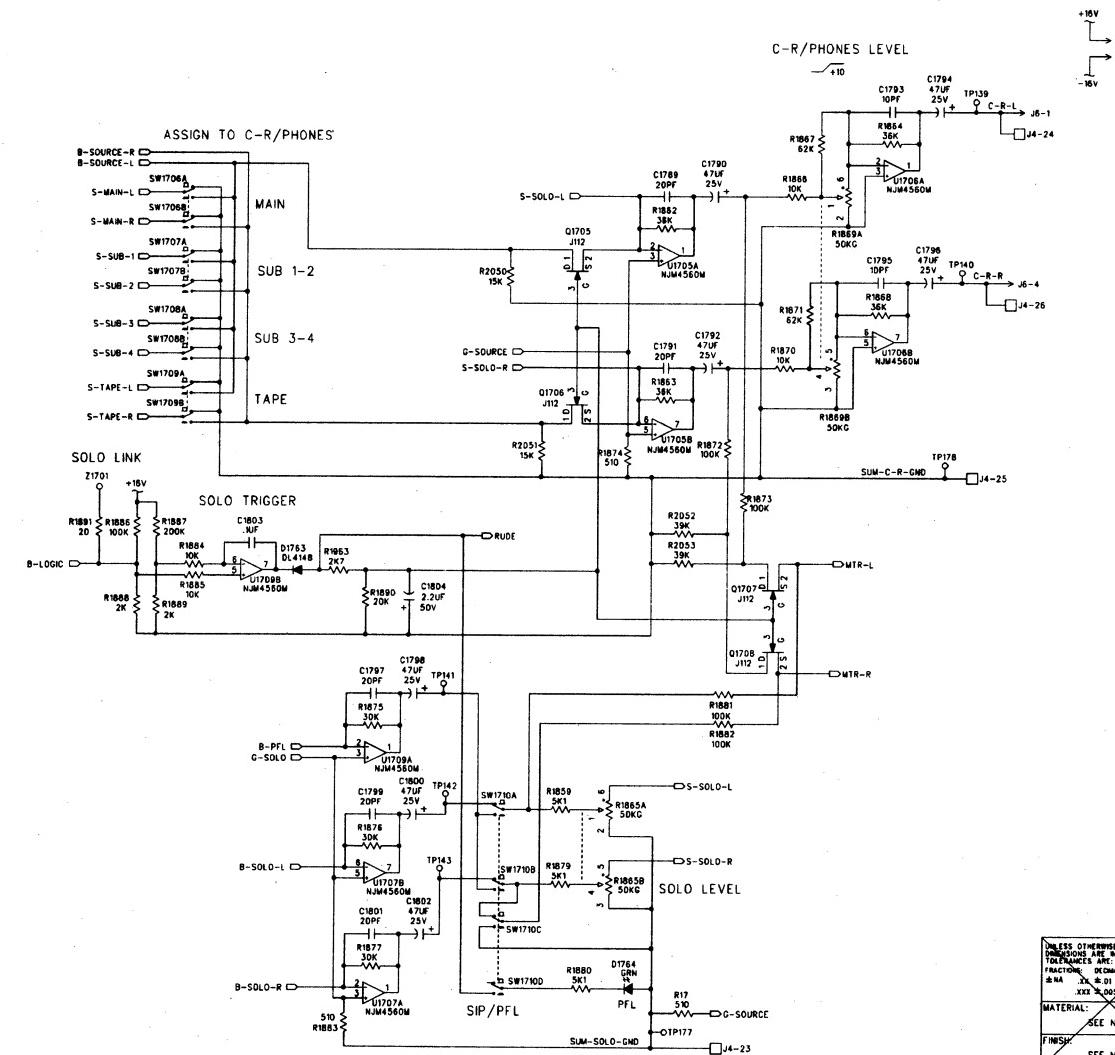
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DRAW: NONE SHEET: 19 OF 22

**MACKIE.** 1604 VLZ PRO SERVICE MANUAL

88 —————— 7 —————— 6 —————— 5 —————— 4 —————— 3

DWC. NO. 890-330-00 SMT REV. A

1

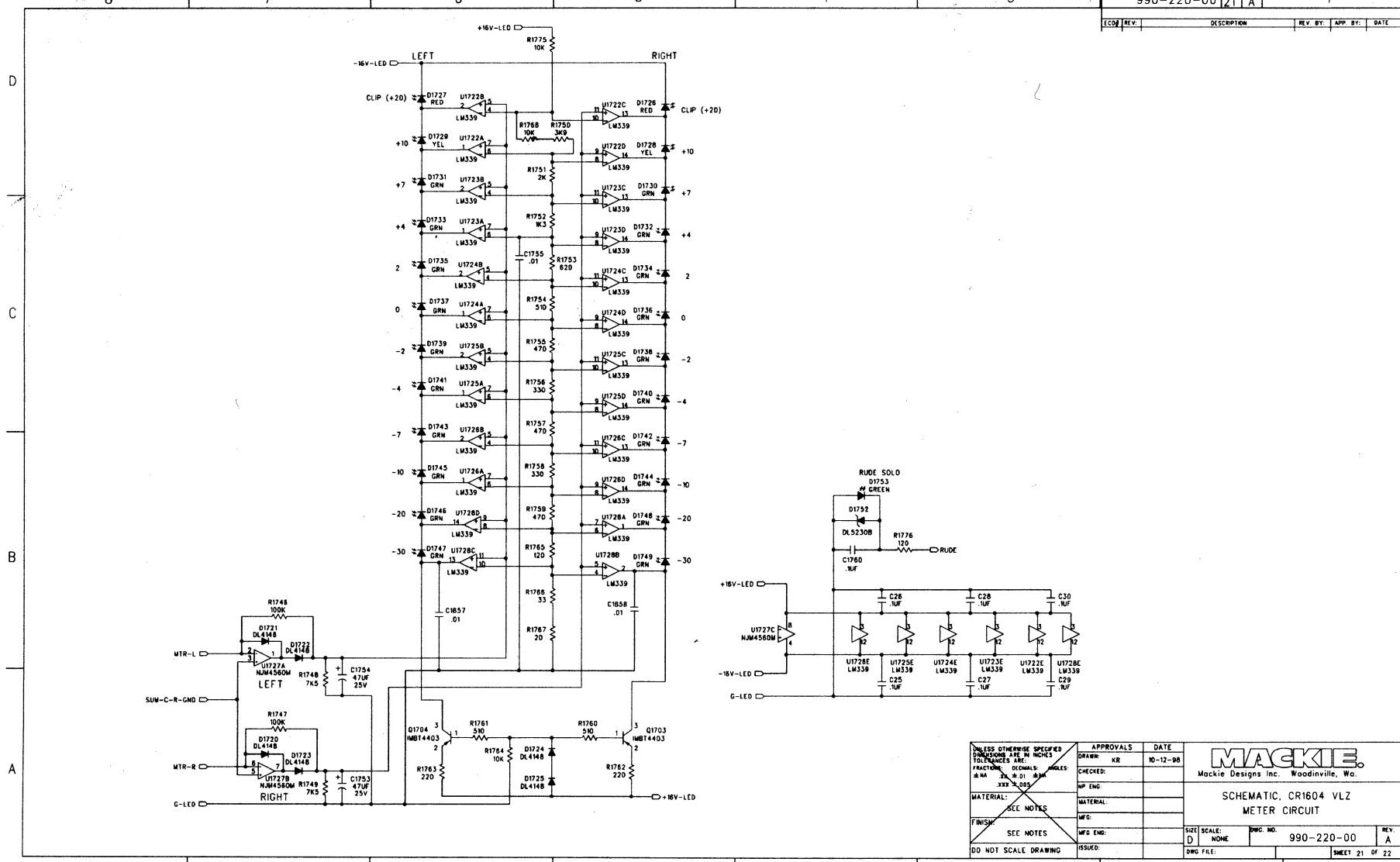


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MATERIAL: ALUMINUM		NP ENG	
FINISH: EPOXY		MATERIAL:	
SEE NOTES		ENG'D:	
		ENG'D BY:	
		ISSUED:	
DO NOT SCALE DRAWING		SIZE: D SCALE: NONE DWG. NO. 990-220-00 RE A	
		DWG FILE: SHEET 20 OF 22	

220-5

MAIN BOARD 220 REV A

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MAIN BOARD 220 REV A

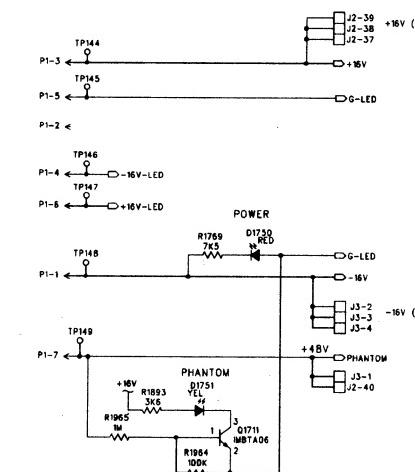
220-6

**MACKIE.** 1604 VLZ PRO SERVICE MANUAL

8 7 6 5 4 3 Dwg. No. 900-000-00 REV.

Dwg. No.	990-220-00	SMT	REV		1		
ECON	REV:	DESCRIPTION			REV. BY:	APP. BY:	DATE

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132	<input type="checkbox"/> 760-107-00 BTW 2 COLOR 9X5MM
16	<input type="checkbox"/> 760-108-00 BTW 2 COLOR 9X9MM
1	<input type="checkbox"/> 706-009-00 SPACER, NYLON, LEO .30
1	<input type="checkbox"/> 620-023-00 FLAT CBL 4 PIN 3.5"
1	<input type="checkbox"/> 450-220-00 CABLE 12AWG T/T M/H



220-

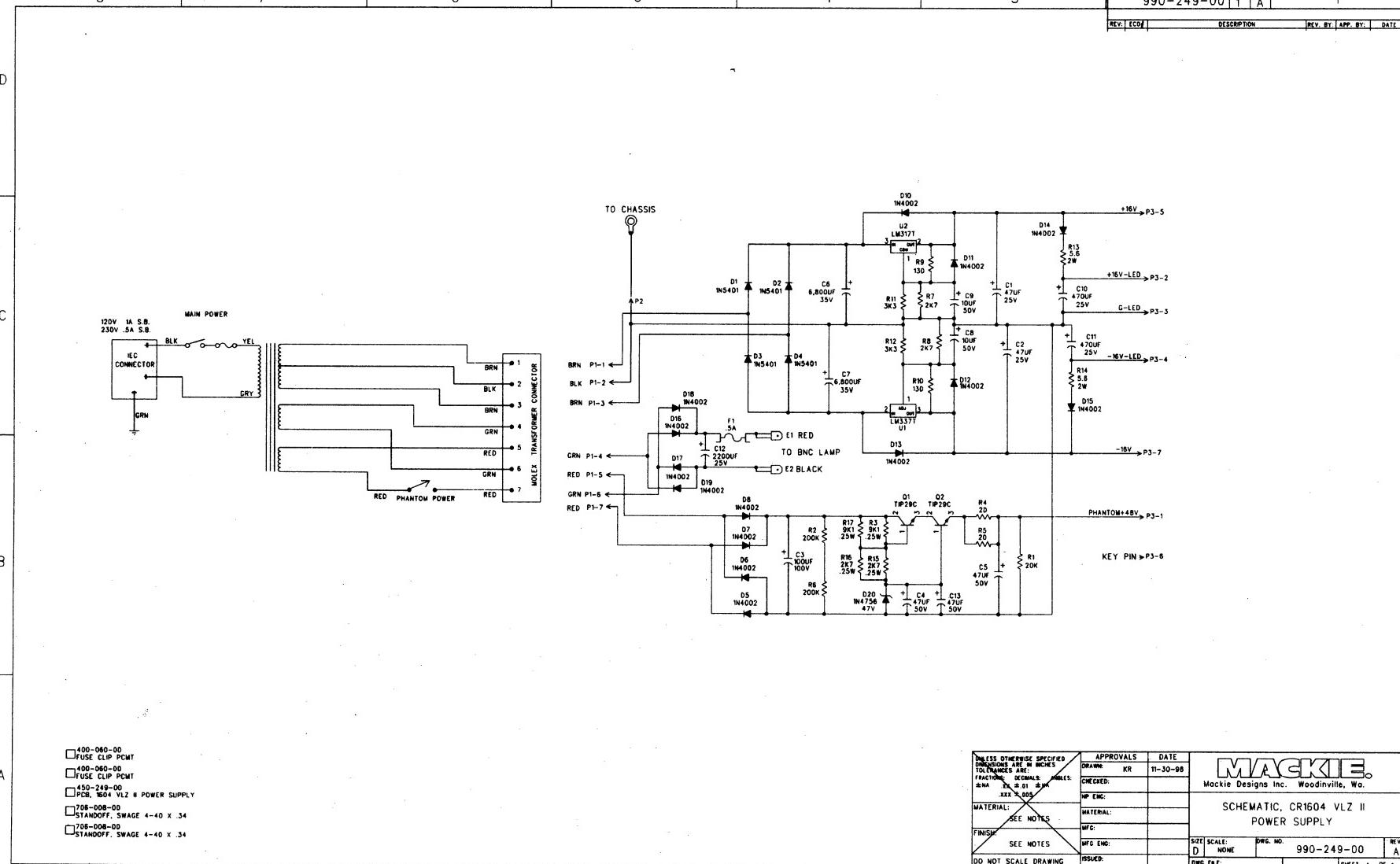
MAIN BOARD 220 REV

REV. NO. 990-249-00

SHT 1 REV A

1

REV. ECD	DESCRIPTION	REV. BY APP. BY DATE
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- 400-060-00 FUSE CLIP PCMT
- 400-060-00 FUS CLIP PCMT
- 450-249-00 PCB FOR VLZ II POWER SUPPLY
- 729-008-00 STANOFF, SWAGE 4-40 X .34
- 705-008-00 STANOFF, SWAGE 4-40 X .34

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE IN THOUSANDS OF AN INCH FRACTIONS, DECIMALS, MODELS: INCHES EX. #.015 IN.		APPROVALS	DATE
		DRAWN: KR	11-30-98
		CHECKED:	
		MP ENG:	
		MATERIAL:	
		INFO:	
		FINISH:	
		SEE NOTES	
		DD NOT SCALE DRAWING	ISSUED:
SIZE: D	SCALE: NONE	Dwg. No. 990-249-00	Rev. A
DWG FILE:		SHEET 1 OF 1	

**MACKIE.**  
Mackie Designs Inc. Woodinville, Wa.

SCHEMATIC, CR1604 VLZ II  
POWER SUPPLY